ELECTRIC

BRISBANE CITY COUNCIL

COCKLE STREET WATER PUMPING STATION WP 08

CONTRACT BW 439 02/03

Job Number JO 6893

MAIN SWITCHBOARD

OPERATIONS and MAINTENANCE MANUAL

MANUFACTURED BY

SJ Electric (Qld)
19 Elliot Street Albion Qld. 4010
Telephone 07 3256 1522 Fax 07 3256 1533

SCSQ

Completed 1-AUGUST 2003

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ELECTRICAL ENGINEERS, CONTRACTORS & SWITCHBOARD MANUFACTURERS

SJ ELECTRIC

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General Workplace Health and Safety

- The Queensland Workplace Health and Safety Act (1995) details minimum requirements relating to safe working in the electrical industry. Nothing in this document is designed, in any way, to undermine the authority of the Act.
- All reasonable care must always be taken to ensure the plant is without risk to the health and safety of personnel operating and maintaining plant and equipment.
- Employers have an obligation to ensure the workplace health and safety of all personnel at work.
- It is employer responsibility to ensure that all persons entering or working on the premises use appropriate personal protective equipment.
- Personal protective equipment includes gloves, safety glasses, hard hats, ear protection, safe foot ware and, where necessary, specialist protective clothing for hazardous areas.
- Any item of equipment should always be isolated before maintenance or repairs commence to ensure that inadvertent operation of the item does not result in risk to the health and safety of any person.
- Where the item is isolated, any total or partial shutdown should not allow a hazardous situation to be created.
- Where the item cannot be isolated, another person should be stationed at the controls of the item and an effective means of direct communication should exist between the persons carrying out the maintenance and the person at the controls.

General Operating Principles

- All persons working the premises must be qualified Electrical Engineers or electrical trades persons capable of performing the required tasks competently. All personnel must also be familiar with plant and equipment.
- Adequate information, instruction, training and supervision must be provided to enable personnel to perform work without risk to health and safety.
- Work in an orderly way.
- Plan work in advance to avoid hazardous situations.

- Warn others of any hazards.
- Make inquiries before starting work, particularly on any unfamiliar installation or equipment.
- Before any work begins ensure that any instructions received or given are fully understood.
- Concentrate on the task on hand.
- Do not distract others or allow yourself to be distracted by foolish actions.
- Work from a safe and convenient position that provides a maximum working space that you do not have to over reach, you cannot slip, trip or stumble and so endanger yourself and others.
- Keep the working area tidy and free of unwanted materials and equipment.
- Use insulated tools where possible.
- Inspect tools and equipment regularly and ensure that any necessary maintenance is carried out.
- Keep yourself in good health.
- Do not work if ill or over tired, to the extent that your concentration, movement or alertness is affected. Illness or fatigue can endanger yourself and others.

Project Overview

Contract BW 43-02/03 was for the Design ,manufacture, installation and testing of a new Main switchboard for the Cockle Street WaterPumping Station located in Brisbane.

Equipment provided by SJ Electric ensures safe and efficient operation of the Inlet Works. Equipment supplied and installed by SJ Electric includes: -

- Switchboard;
- Generator Terminal Box

The switchboard incorporates the latest technology in motor control, power monitoring, and instrumentation. It is important engineers, technicians and operators are familiar with the equipment installed before attempting any adjustments, modifications or maintenance.

The following Sections of this manual contain a comprehensive description of all equipment supplied, by SJ Electric . It is recommended that this manual be referred to before carrying out any work on any equipment.

Plant Maintenance

To ensure proper operation of the plant the following should be observed :-

- The plant should be kept clean and tidy at all times. Not only is this of aesthetic value, it extends equipment life.
- Check that all plant and equipment is operating correctly. Correctly operating equipment promotes overall plant efficiency.
- All items and areas of equipment should be hosed down and cleaned regularly.

WARNING

- **Avoid directly hosing any drive motor or electrical item.**

- All maintenance, service, modifications and significant deviations from Normal operating conditions should be recorded in the Plant Service Log
- After a month of operation, check the tension of all bolts associated with the plant and thereafter periodically. Bolted connections on painted surfaces can loosen due to thinning of the paint underneath the bolt head bearing surface. Motor mounting bolts and other bolted connections subjected to vibration should be periodically checked for loosening.

WARNING

- **Before starting work on any item ensure that the power supply is isolated, tagged off, and the item cannot be started.**

- The importance of preventative maintenance cannot be over-emphasized. Regular maintenance and suitable care of the equipment will ensure a long and reliable service life of the equipment.
- Many stoppages can be avoided by following the recommended maintenance procedures. Do not wait until you hear the grinding of equipment that has broken down. If you see any item wearing down, replace it, before it causes damage to other associated items.

Preventive Maintenance

Maintenance procedures recommended to extend switchboard life are outlined as follows :-

- Switchboard exterior should be regularly wiped down with a solvent base cleaner such as "Spray & Wipe". This will ensure longevity of the powder coated surface.
- Accessible areas like distribution boards and motor starter panels should be cleaned with a vacuum cleaner to remove dust and foreign matter.
- PLC panels should be maintained as dust free as possible. Dusting with a dry rag is recommended - taking care not allow dust inside the I/O modules or processor.
- When removing or installing PLC modules care should be taken to ensure that power is turned off to the rack before modules are removed or installed.
- Connections and efficient operation of circuit breakers, contactors and isolators should be checked every 12 months - especially where connected to busbars.
- Busbar connections should be checked every 12 months.
- Globes for indicator lights should be checked on a weekly basis with any faulty lamps replaced.

Electrical Control System

General Description

Electrical control equipment for the installation is housed in the switchboard located on the rear wall of the pump station.

- Main Incomer
- Generator Incomer
- Distribution Section
- Pump Control Cubicles
- Common Control Cubicle.

The switchboard has been constructed of mild steel of a dead front construction.

Control and Monitoring System.

The control and monitoring of the system is performed by the Brisbane Water telemetry system and was not included in this contract.

SJ ELECTRIC

TECHNICAL DATA SHEET

For

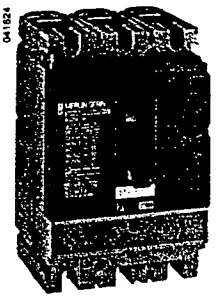
Cockle Street Pump Station

Equipment Type:	Circuit Breaker
Location:	Main Incomer Pump Circuit Breakers
Model Numbers:	NS 400 & NS630
Manufacturer:	Merlin Gerin
Supplier:	Schneider Electric. 30 Graystone Street TINGALPA QLD 4173 Ph: 07 3890 2112 Fx: 07 3890 2098

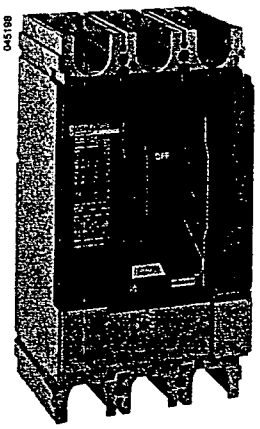
Compact NS100 to 630 circuit breakers with MA magnetic trip units

Compact NS100 to 630 circuit breakers, equipped with an MA magnetic trip unit with adjustable thresholds, offer:
- *short-circuit protection*
- *suitability for isolation.*

Compact NS100 to 630 circuit breakers and the trip unit are supplied already assembled.



Compact NS250H



Compact NS400H-MA

General circuit-breaker characteristics page 16

MA trip units

Rating (A)	at 65 °C	In	2.5	6.3	12.5	25	50	100	150	220	320	500
Compact	N/H/L	NS100	■	■	■	■	■	■	-	-	-	-
circuit breaker		NS160	-	-	-	■	■	■	■	-	-	-
		NS250	-	-	-	-	-	■	■	■	-	-
	H/L	NS400	-	-	-	-	-	-	-	-	■	-
		NS630	-	-	-	-	-	-	-	-	-	■

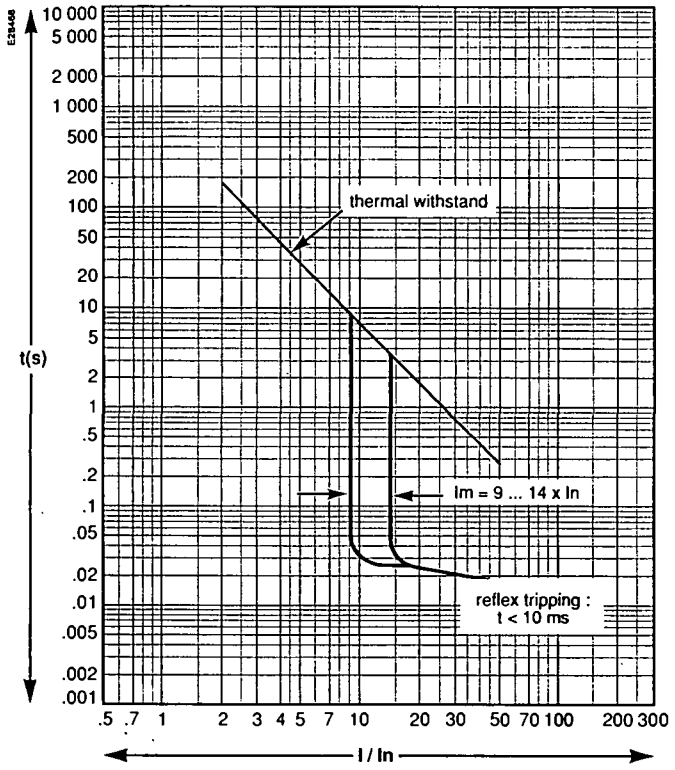
Short-circuit protection (magnetic)

Pick-up	Im	setting 6...14 x In						setting 9...14 x In		setting 9...14 x In	

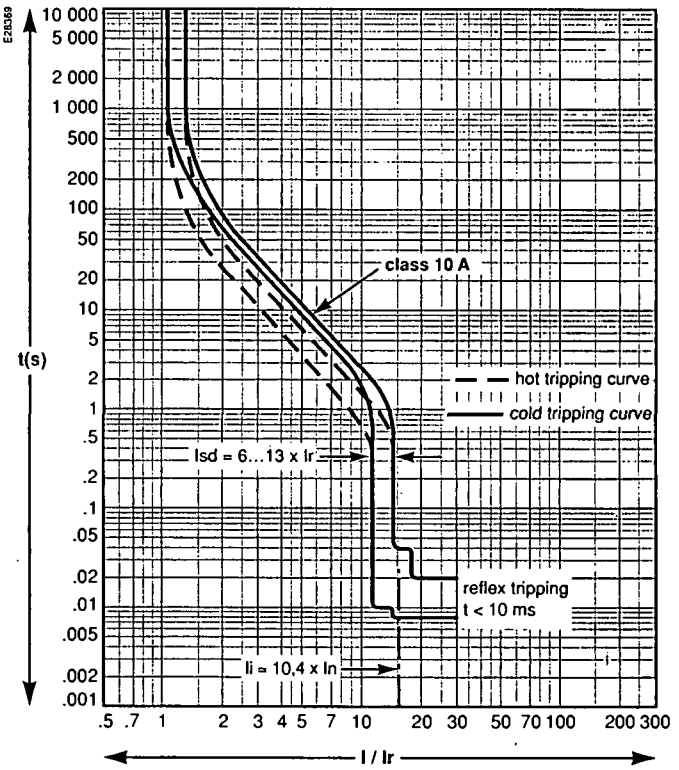
Compact NS400 to 630
Motor-starter protection

MA magnetic and STR43ME electronic trip units

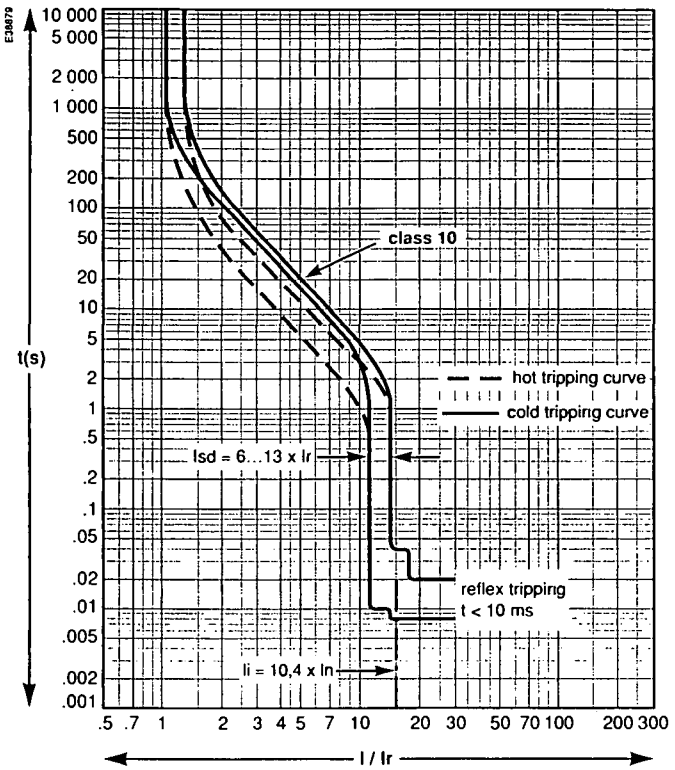
MA320 - MA500



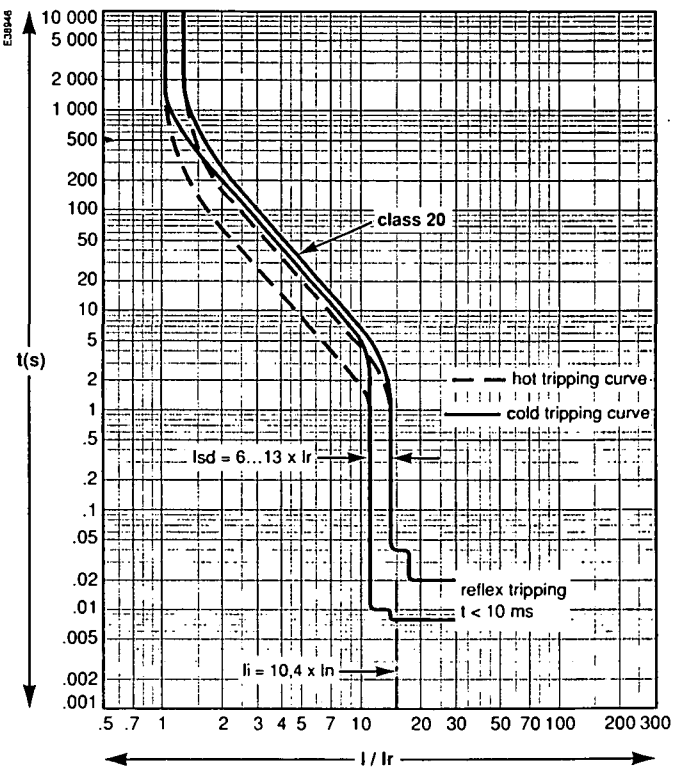
STR43ME - 120 to 500 A - class 10 A



STR43ME - 120 to 500 A - class 10



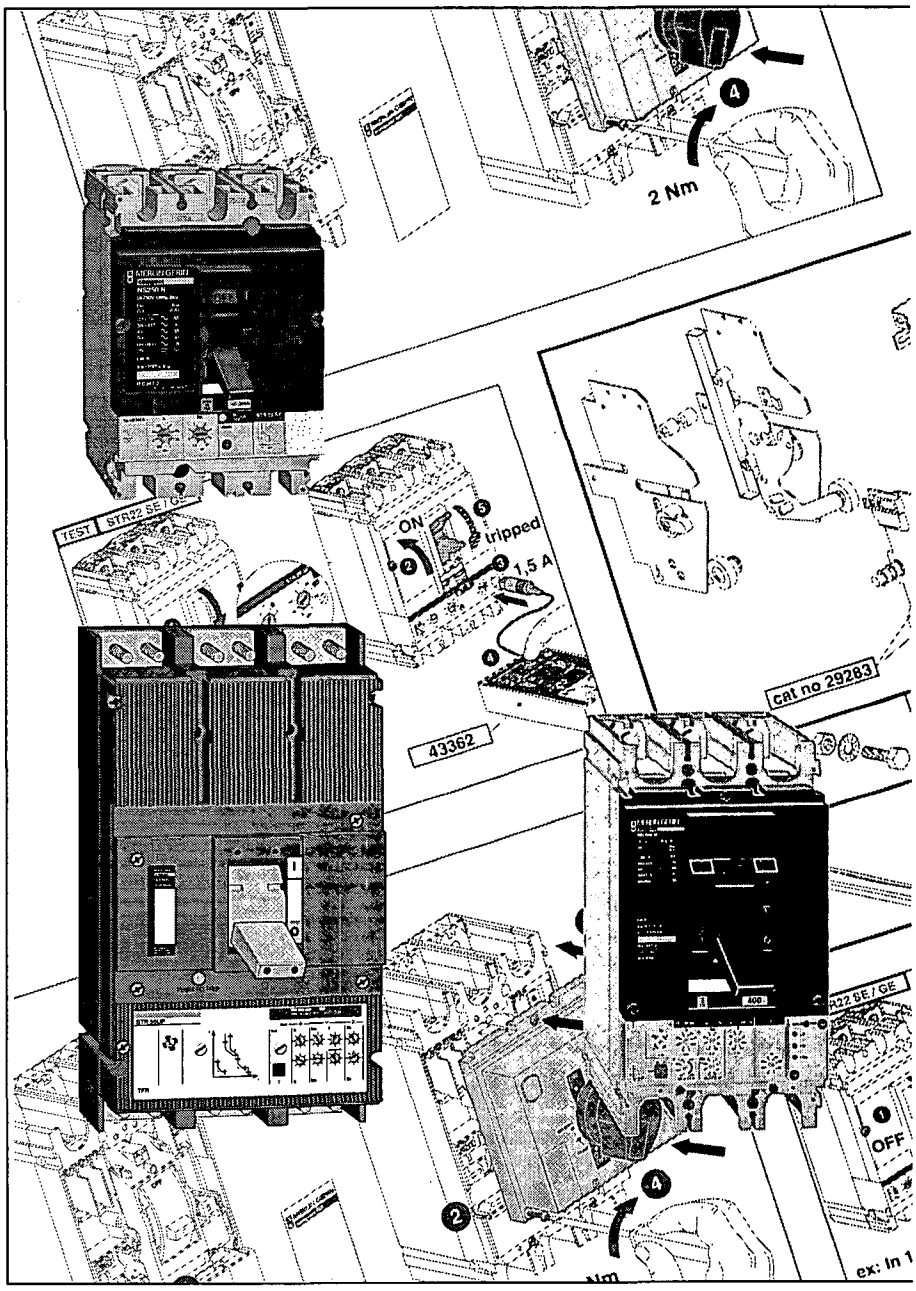
STR43ME - 120 to 500 A - class 20



Thermal-withstand capacities are given for circuit breakers operating in an ambient temperature of 65 °C.

Low voltage switchgear
Compact Merlin Gerin

Exploitation guide



Merlin Gerin
Modicon
Square D
Telemecanique

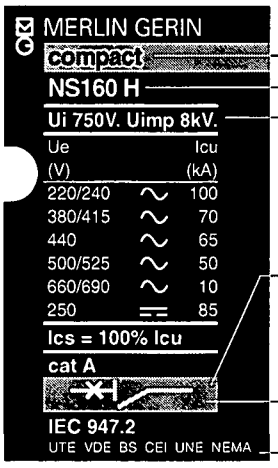
Schneider Electric

summary

discovering your circuit breaker

the toggle operated circuit breaker

rating plate



range

model (rating and breaking capacity)

standardised characteristics:
- Ui = rated insulation voltage
- Uimp = impulse withstand voltage
- Ue = rated operational voltage
- Icu = ultimate breaking capacity
- Ics = service breaking capacity

colour indicating the type of device:
- yellow = E
- silver = N
- pink = H
- blue = L
- green = switch

symbol indicating suitability for isolation as defined by IEC 947.2

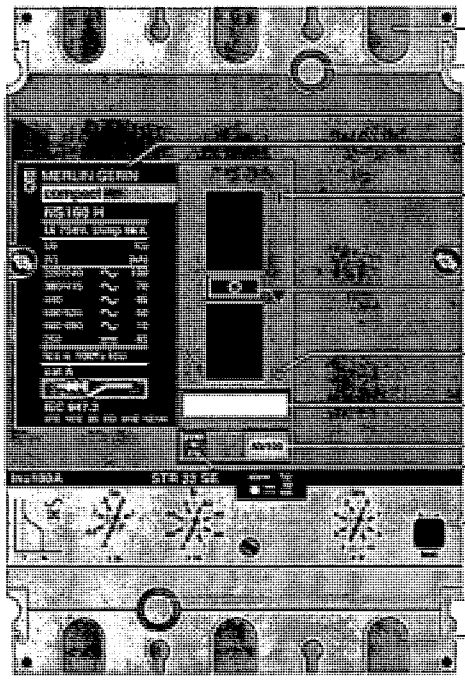
main standards with which device conforms

posative contact indication

Compact NS circuit breakers are suitable for isolation as defined by IEC 947-1 et 947-2.

When the toggle is in the "OFF" position, the main contacts are ALWAYS open.
It is therefore possible to carry out maintenance on the downstream circuits. When doing so, it is advised to lock the circuit breaker in the OFF position and to comply with applicable servicing regulations for low voltage circuits.

circuit breaker with toggle



upstream connections

fixing hole

rating plate **(see above)**

indication of closed **(I/ON)** position

toggle (shown in tripped position)

indication of open **(O/OFF)** position

circuit identification

trip unit rating

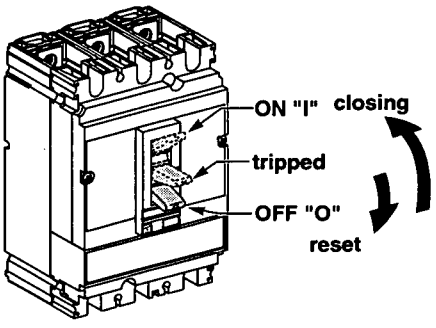
"push to trip" button

trip unit **(see page 11)**

fixing hole

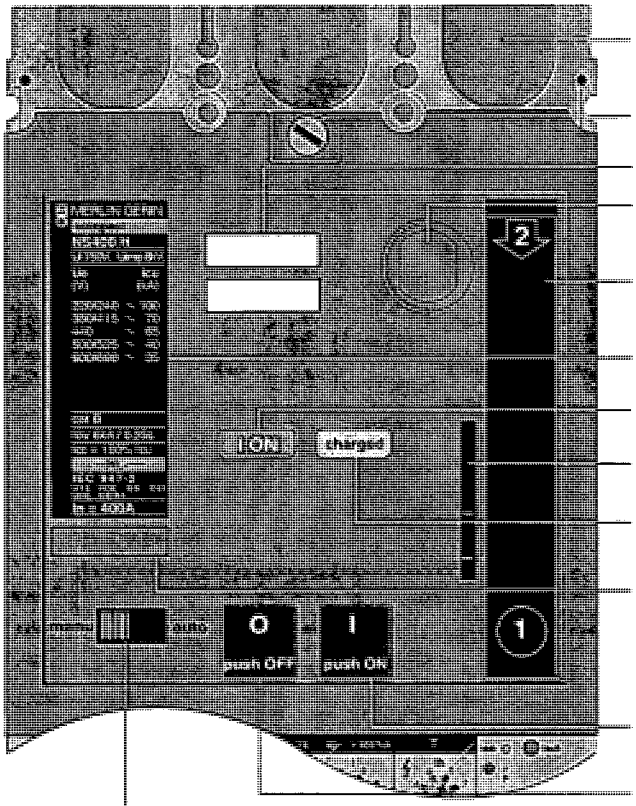
downstream connections

Resetting following a trip
When the circuit breaker is in the "tripped" position it must first be reset by moving the toggle to the OFF position before reclosing is possible.



the motor mechanisms

NS100 to 630 motor mechanisms



The motor mechanism module can be used to open and close the circuit breaker and charge the operating mechanism spring via electrical signals.
Its position and small dimensions leave trip unit settings visible and accessible. It can be tipped forward for access to connections ans auxiliaries (voltage releases, indication switches).

(1) main contacts position indicator

I ON	**closed**
O OFF	**open/isolated**

Isolation is guaranteed when the indicator signals OFF.

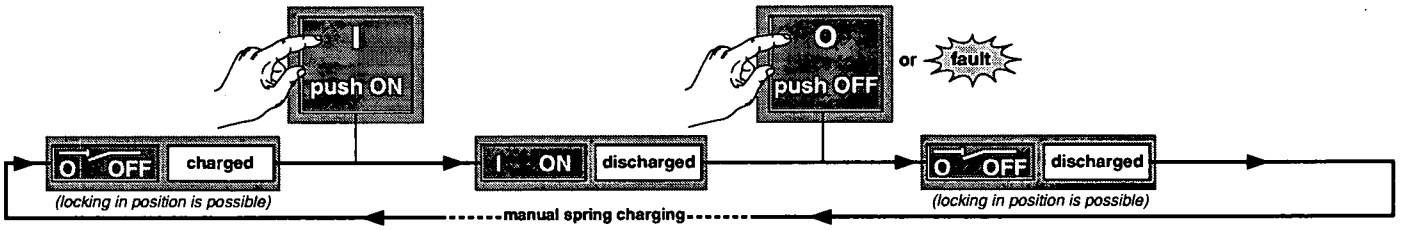
(2) mechanism status indicator

charged	**spring charged**
discharged	**spring discharged**

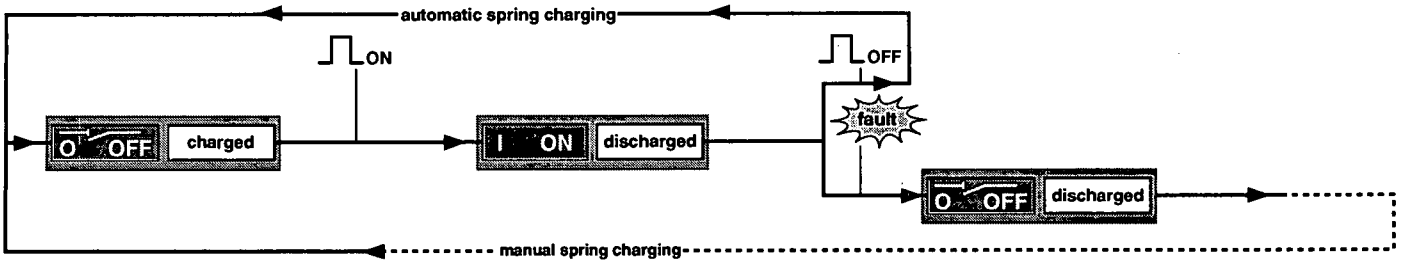
(3) manual/automatic operation selector :

- in manual mode, electrical control signals are inhibited,
- in automatic mode, only electrical control signals are executed.

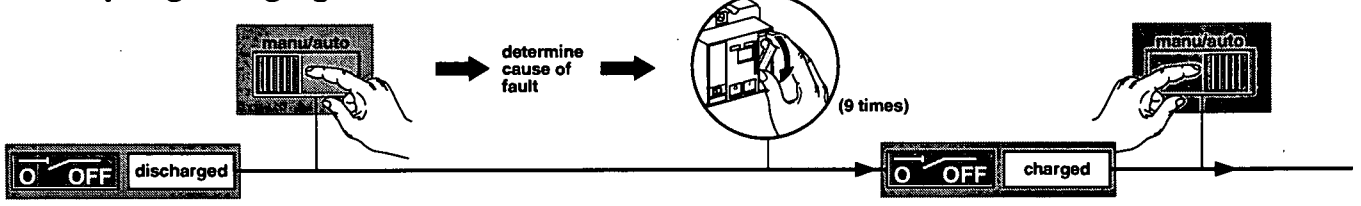
operation cycle in manual mode



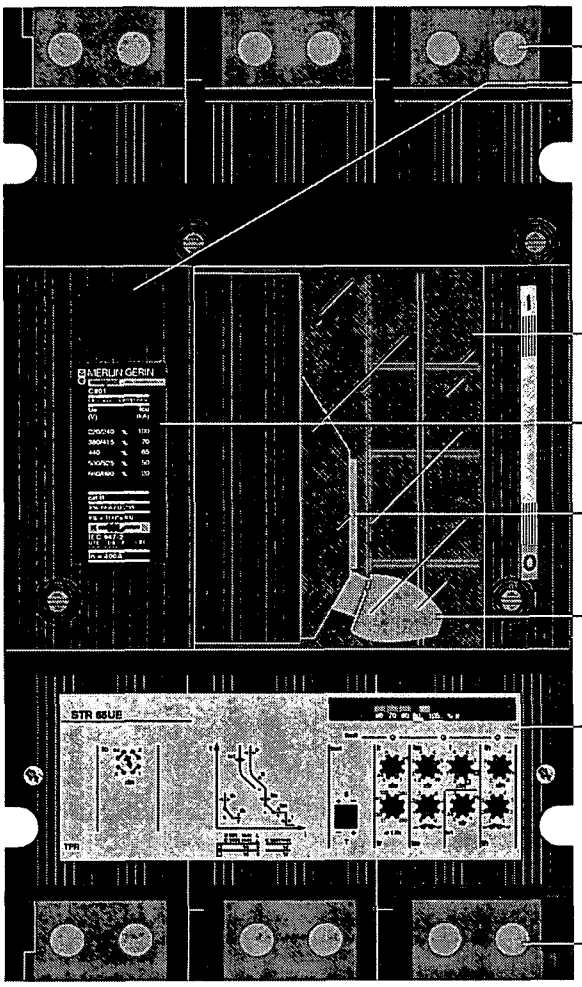
operating cycle in automatic mode



manual spring charging



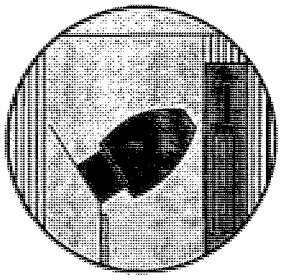
C801 to C1251 type T motor mechanism



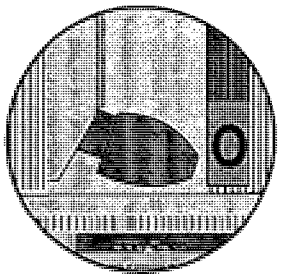
The motor mechanism module can be used to open and close the circuit breaker via electrical signals.
Its position and small dimensions leave trip unit settings visible and accessible.
It can be tipped forward for access to connections ans auxiliaries (voltage releases, indication switches).

Manual operation is possible by opening the transparent front cover :
- breaks the electrical circuit.
- gives access to the operating handle (open - close).
- allows the device to be locked by up to 3 padlocks.

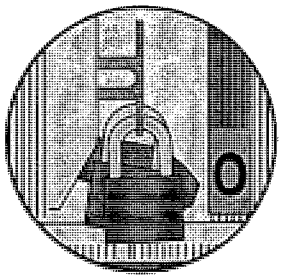
Position "ON" closed



Position "OFF" open

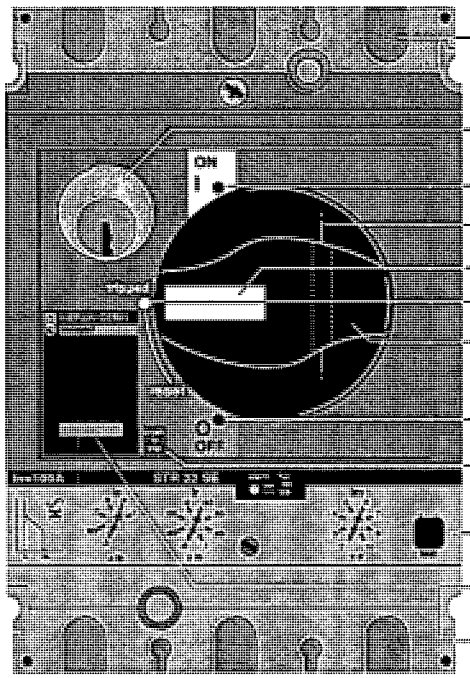


Locking by 3 padlocks



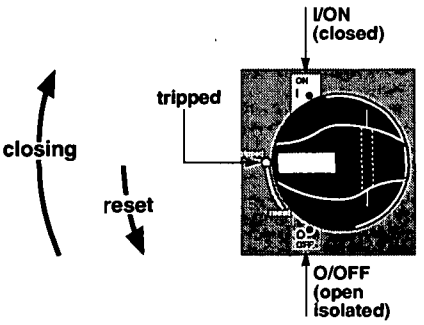
the circuit breaker with rotary handle

circuit breaker with rotary handle



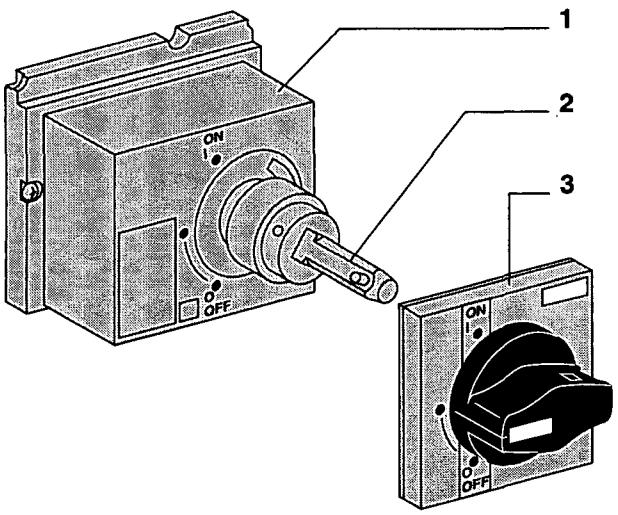
The direct and extended rotary handles do not inhibit:
- visibility of and access to trip unit settings,
- positive contact indication (suitability for isolation),
- indication of the three positions: O, I, "tripped",
- access to the trip test buttton marked "push to trip".

Compact NS100 to 630 optional handles:
the following accessories are available :
- MCC version (motor control and command),
- machine tool version.



circuit breaker equipped with an extended rotary handle

The extended rotary handle comprises :
- a case mounted on the Compact NS in place of the front cover **(1)**,
- an extension shaft **(2)**,
- an assembly fixed to the door (handle and front) **(3)**.



Options :
Telescopic shaft for devices mounted on a withdrawable chassis.
With the exception of the rating plate and the "push to trip" button, the extended rotary handle provides the same information as the direct rotary handle, and is achieved in the same manner.

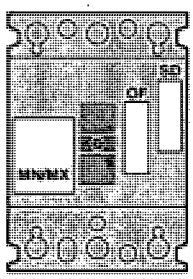
Access to the trip unit settings and the "push to trip" test button is possible when the door is open.

Compact C801 to C1251 option :
includes the same components as the door interlocking version, but is only available with a short extension shaft.

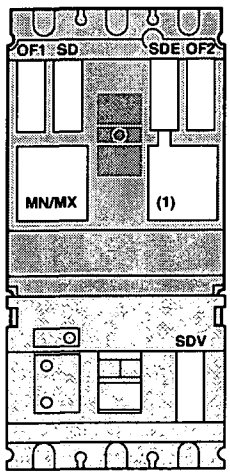
CAM (early make/break contacts)
- a single early break changeover contact, used to operate pre-tripping mechanisms.
- a double early make contact.

Both these contacts are mounted in the 'handle front box' for both the direct and extended versions.

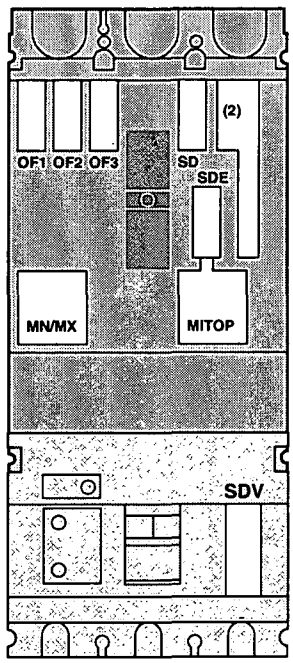
electrical auxiliaries



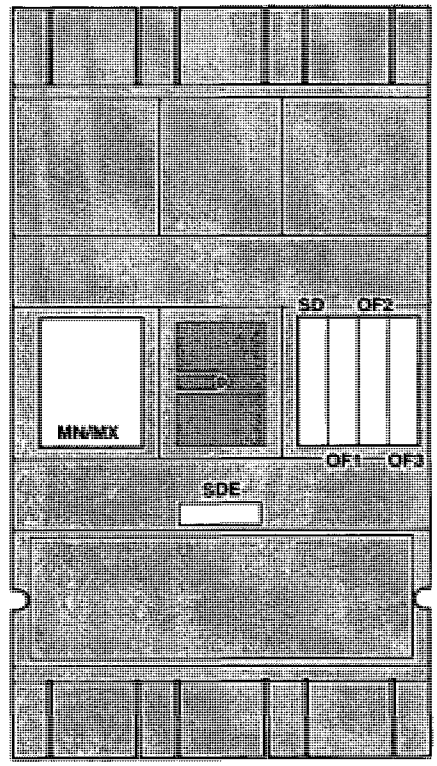
Compact NS80



Compact NS100/160/250
+ Vigi (optional)



Compact NS400/630
+ Vigi (optional)



Compact C801/1001/1251

(1) slot for:
- **a MITOP release** if the circuit breaker is fitted with an electronic trip unit;
- **an adapter** required if the circuit breaker is fitted with a thermal-magnetic trip unit and an SDE contact.

(2) slot for auxiliary connections for STR53UE trip unit options.

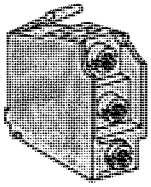
All auxiliaries are located behind the circuit breaker front plate, the motor mechanism module or the rotary handle, in a compartment insulated from the power circuits.
Function and terminal markings are embossed on the circuit breaker frame for each slot.
Auxiliary contacts and releases are physically identical for all ratings.

A single type of auxiliary contact is used for all indication functions (OF, SD, SDE, SDV).
The contact function is determined by the slot it occupies in the circuit breaker.
Auxiliary contacts snap easily into position.

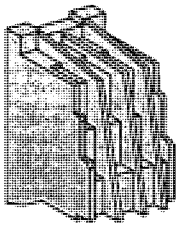
Connections are made via integrated screw terminals.

electrical auxiliaries

auxiliaries switches



For NS100 to NS630



For C801 to C1251

Auxiliary contacts remotely indicate circuit breaker positions.

Contact OF
NC and NO changeover contact.
This auxiliary contact indicates the position of the circuit breaker contacts (open or closed).

Contact SDE
fault trip indication.
This auxiliary contact indicates that the circuit breaker has tripped due to an electrical fault:
- overload,
- short-circuit,
- insulation fault detected by the Vigi module.

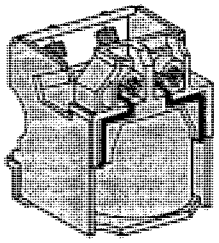
Switch SD
trip indication.
This auxiliary contact indicates that the circuit breaker has tripped due to one of the following:
- overload,
- short-circuit,
- earth fault,
- an MX or MN release,
- pressing of the "Push to trip" button,
- racking in or out,
- manual opening on the front of the motor mechanism module.

Contact SDV
insulation fault indication.
This auxiliary contact indicates that the circuit breaker has tripped due to an earth fault.

Contact CAM
early make/break contact which mounts in the rotary handle.

Option COM (communication).
For transmission of data using the Dialpact protocol.

voltage releases



Voltage releases are used to trip the circuit breaker voluntarily by means of an electric signal (e.g. emergency off button).

Release MN
This undervoltage release trips the Compact NS when the voltage in its control circuit drops below 70% of the rated voltage.
The circuit breaker can be reclosed as soon as the voltage has reached 85% of the rated value.

Release MX
This shunt release trips the Compact NS as soon as the voltage across its terminals reaches 70% of the rated voltage.

how to set up your trip unit

trip unit settings - general comments

trip unit settings - details

increased setting range with 150 and 250 A CTs

remote indication and electronic trip unit options

testing of electronic trip units

electronic trip unit settings for motor protection

trip unit settings - general comments

The trip unit is the component that monitors the electrical current flowing through the circuit breaker and opens the circuit breaker in the event of a fault.

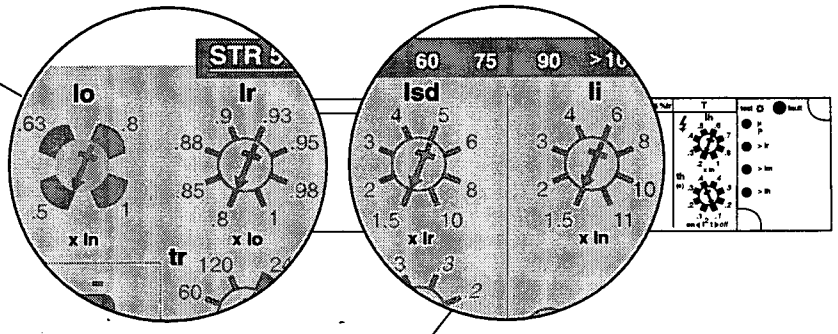
- thermal-magnetic and electronic trip units detect overloads and short-circuits;
- Compact circuit breakers can also be fitted with a Vigi earth-fault protection module that trips the circuit breaker in the event of an insulation fault (risk of electrocution or fire due to earth leakage current).

All Compact trip units (NS100 to NS630) incorporate the reflex-tripping system, an exclusive Merlin Gerin feature that ensures discrimination, even for very high short-circuit currents.

overload protection

Tripping time depends on the level of the fault:

- the circuit breaker will trip within 2 hours for a current equal to :
  - 120% of Ir for electronic trip units,
  - 130% of Ir for thermal-magnetic trip units.
- the circuit breaker must not trip for a load under 105% of Ir.



short circuit protection

The tripping is :

- time delayed as soon as the current exceeds the Isd threshold.
- instantaneous as soon as the current exceeds the Ii threshold.

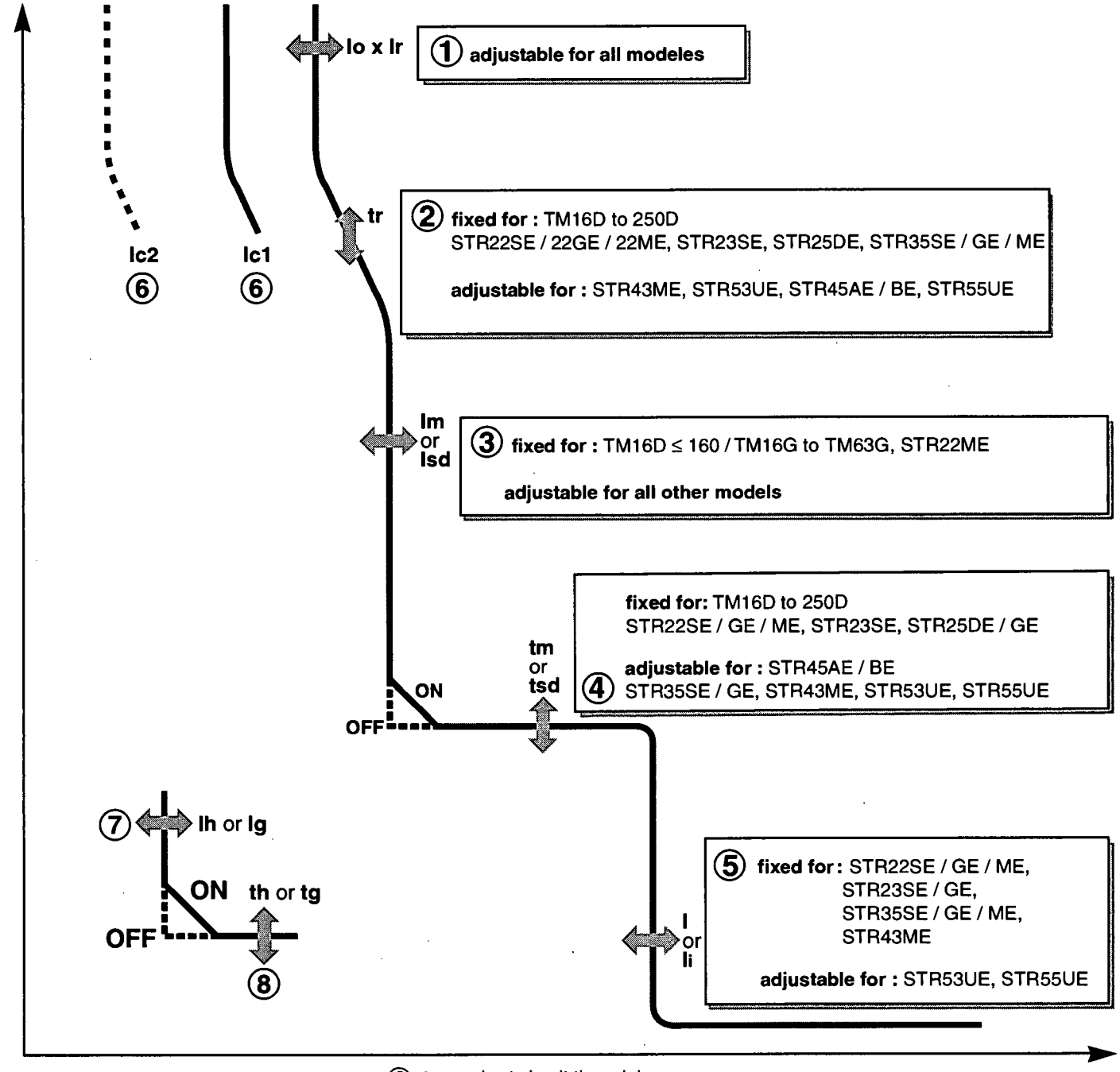
The ME trip units conform to IEC 947-4.1 (motor protection).

In 1997, IEC 947-4.2 brought modification to the symbols related to the settings of the trip units. These modifications are :

- the short circuit threshold is **Isd** (instead of Im)
- the short circuit time delay is **tsd** (instead of tm)
- the instantaneous threshold is **Ii** (instead of I)
- the earth fault protection threshold is **Ig** (instead of In)
- the earth fault protection time delay is **tg** (instead of **tn**)

These new symbols have been applied to NS400/630 trip units STR53UE and STR43ME (issued after the modification)

terminology of the overload and short-circuit protection settings



Long time protection against overloads

① **Io** = coarse adjustment (function of In)
Ir = fine adjustment

② **tr** = long time delay fixed or adjustable depending on the trip unit

Short circuit protection

③ **Im** = short circuit threshold, or I²t curve in position ON or **Isd** OFF (depending on the trip unit)

④ **tm** = short circuit time delay or **tsd** fixed or adjustable,

Instantaneous protection

⑤ **I** = instantaneous threshold, or **Ii** fixed or adjustable depending on the trip unit

⑥ **Ic1** = adjustable load shedding threshold for STR45 and STR55
Ic2 = adjustable load shedding threshold for STR45 and STR55

Earth fault protection

⑦ **Ih** = insulation fault threshold, or **Ig** I²t curve in position ON or OFF

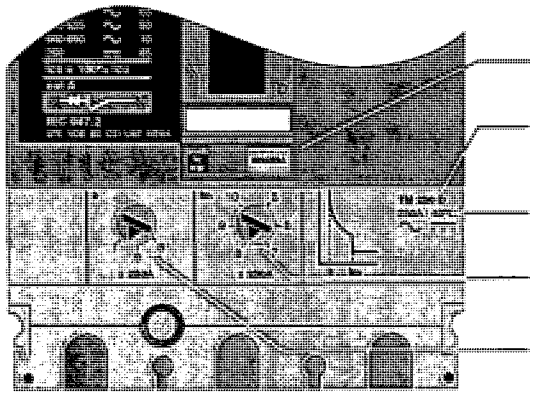
⑧ **th** = earth fault time delay or **tg**

trip unit settings - general comments

Compact NS100-160-250A

2 interchangeable families

thermal-magnetic trip unit



mini/maxi value of thermal protection

trip unit identification

trip unit rating and reference temperature

magnetic setting (or value if fixed) for short-circuit protection

thermal setting for overload protection

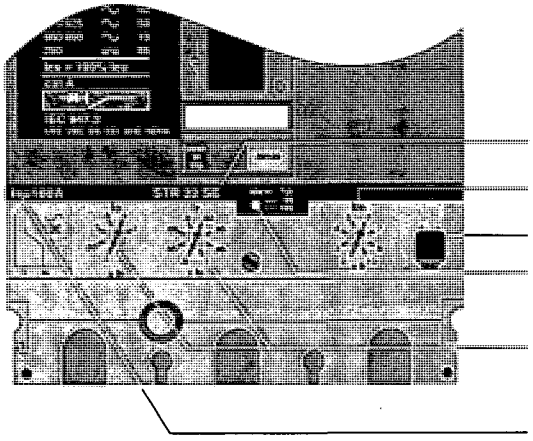
Trip unit identification
TM 250 D

type
D : standard trip unit
G : low magnetic-threshold trip unit

rating

family
TM = thermal-magnetic
MA = magnetic

electronic trip unit



trip unit identification

short time setting **(Im)** for short circuit protection

test connector **(see page 32)**

alarm **(see page 23)**

long time setting Io x Ir **(LR)** for overload protection
Io : base setting
Ir : fine adjustment

trip unit rating (calculation basis for settings)

Trip unit identification
STR 22 SE

E : IEC
P : UL

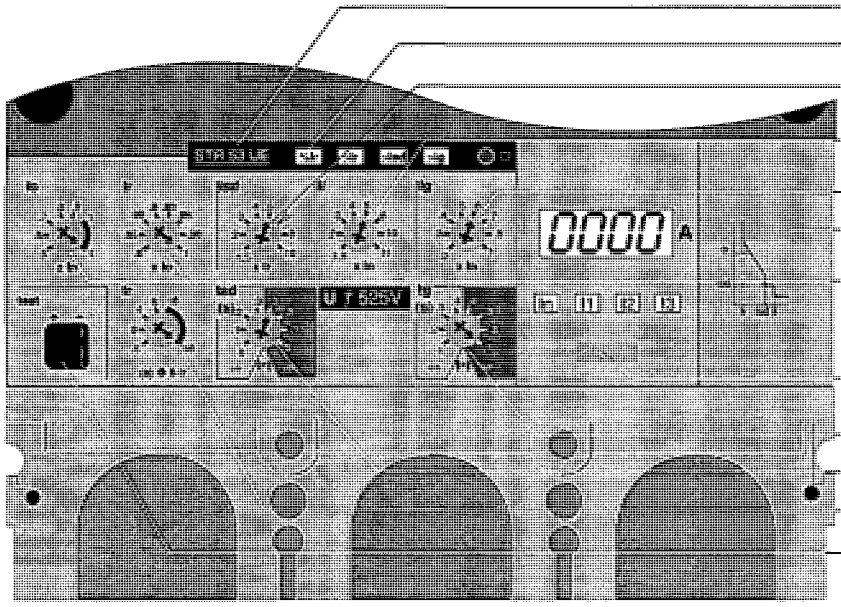
type
S : selective trip unit
G : generator protection trip unit
M : motor protection trip unit

rating group
2 : NS100/160/250

number of settings

family
STR = electronic

Compact NS400-630 A
electronic trip unit STR53UE and STR53SV



trip unit identification
indication/alarm **(see page 23)**
short time setting for short circuit protection **(Isd)**
instantaneous setting for short circuit protection **(Ii)**
earth fault protection **(Ig) (*)**
slot for the SD option **"fault indication"**
long time setting **(LR)** for overload protection
Io : base setting
Ir : fine adjustment
slot for options **"earth-fault"** or **"load monitoring"**
earth fault time delay **(tg) (*)**
short time time-delay setting **(tsd)**
long time time-delay setting **(tr)**
test connector **(see page 32)**

(*) options only for STR53UE

Trip unit identification

STR 53 UE

E : IEC
P : UL

type
S : selective trip unit
U : universal trip unit
M : motor protection trip unit

rating group
3 : NS400/630

number of settings

family
STR = electronic

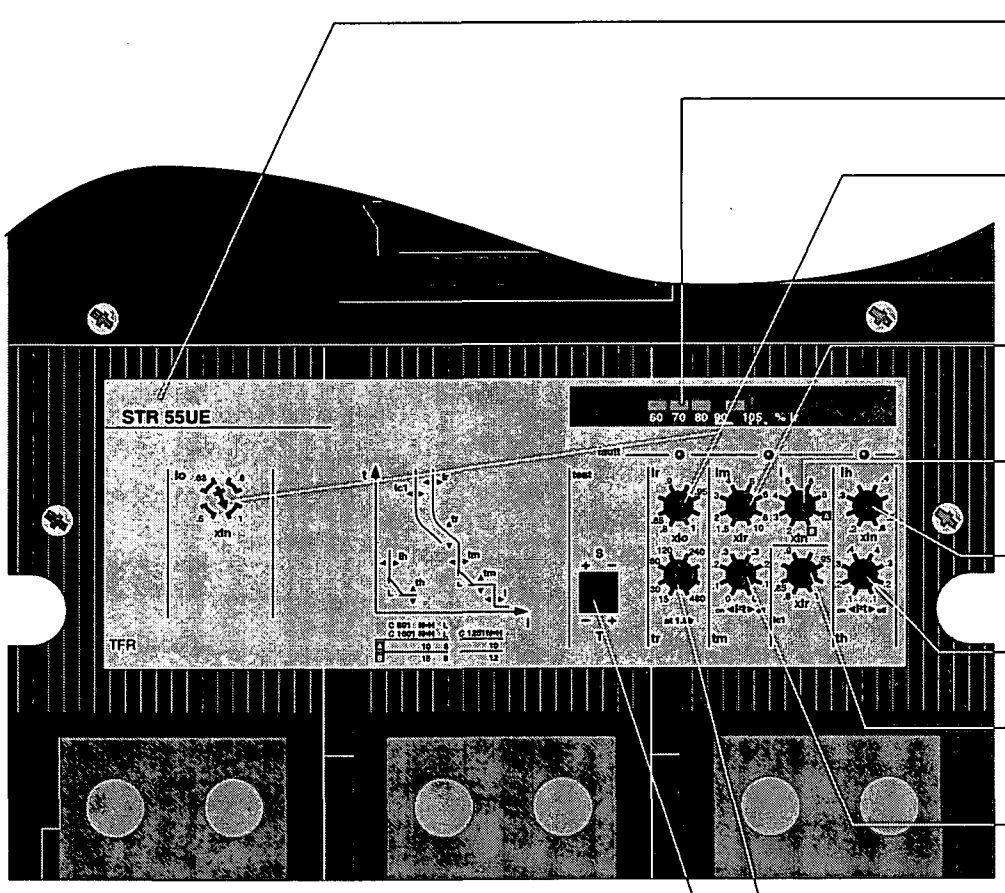
STR 53 SV

U > 525V applications

■ STR23SE and STR53UE are dedicated for use on networks up to 525 Volts (Ue ⩽ 525 V). STR23SV and STR53SV are dedicated for use on ligher operational voltage networks (Ue > 525 V).

trip unit settings - general comments

C801-1001-1251 A
exclusively electronic



- trip unit identification
- indication/alarm **(see page 31)**
- long time setting **(LR)** for overload protection
  Io : base setting
  Ir : fine adjustment
- short time setting for short circuit protection **(Im)**
- instantaneous setting for high short circuit protection **(I)**
- adjustment for earth fault threshold **(Ih)**
- adjustment for earth fault time delay **(th)**
- load monitoring control
- adjustment for short circuit time delay **(tm)**
- adjustment for overload time delay **(tr)**
- test socket **(see page 32)**

Trip unit identification

STR 5 5 U E

standard
E : IEC
P : UL

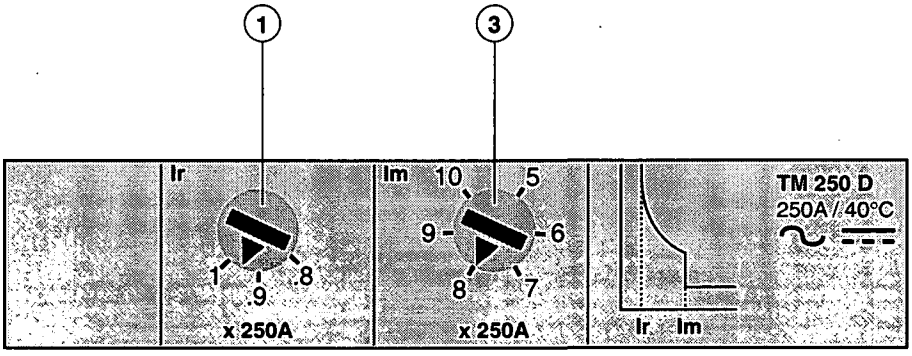
application
I : isolator
D : distribution
S : selective
G : generator protection
M : motor protection
U : universal
B : selim

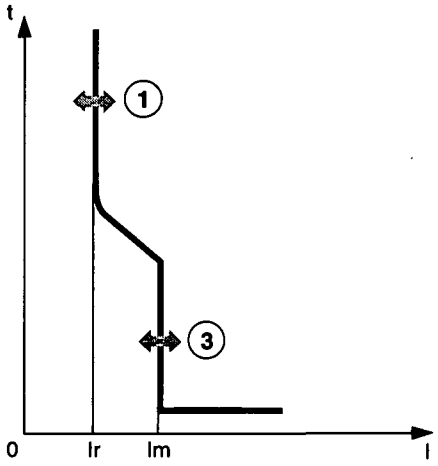
circuit breaker
5 : C801/1001/1251

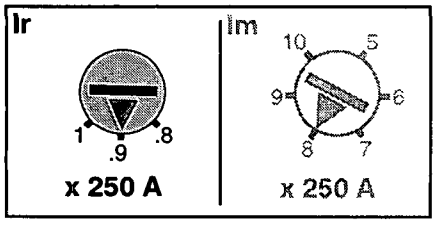
number of settings

family
STR = electronic

trip unit settings - details
thermal-magnetic TM16D to TM250D



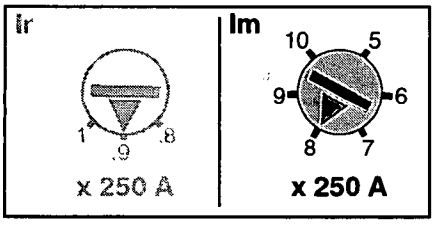




Thermal overload protection

setting	trip unit rating (A)									
	16	25	40	63	80	100	125	160	200	250
0.8	12.8	20	32	50.4	64	80	100	128	160	200
0.9	14.4	22.5	36	56.7	72	90	112.5	144	180	225
1	16	25	40	63	80	100	125	160	200	250

Ir = 250 A x 0.9 = **225 A**

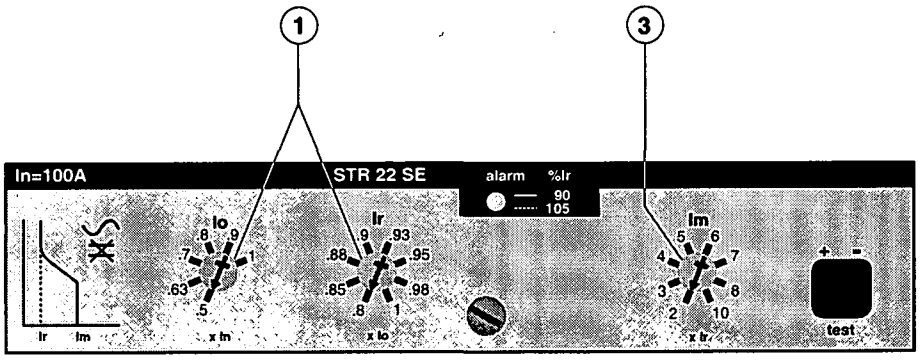


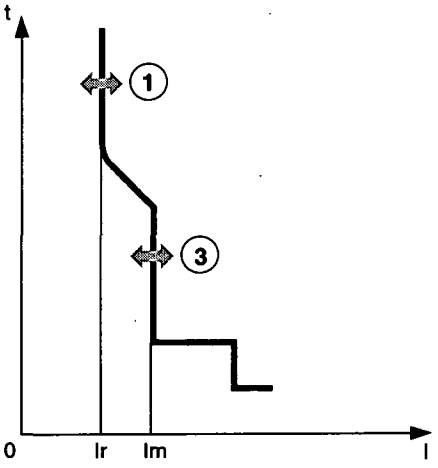
Magnetic short-circuit protection

setting	trip unit rating (A)									
	16	25	40	63	80	100	125	160	200	250
5									1000	1250
6									1200	1500
7									1400	1750
8					fixed				1600	2000
9									1800	2250
10									2000	2500

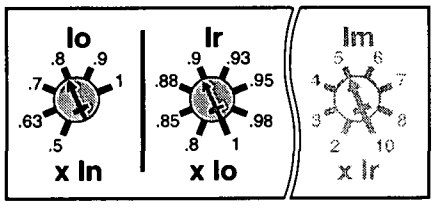
Im = 250 A x 8 = **2000 A** ⟷ The circuit breaker trips instantaneously when the current exceeds 2000 A.

trip unit settings - details electronic STR22SE and STR22GE





electronic trip unit STR22SE and GE rating 40, 100, 160, 250 A



Long time overload protection

STR22SE 40 A	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	16	17	17,5	18	185	19	19,5	20
0.63	20	21	22	22,5	23	23,5	24,5	25
0.7	22,5	24	24,5	25	26	25,5	27,5	28
0.8	25,5	27	28	29	29,5	30	31	32
0.9	29	30,5	31,5	32	33,5	34	35	36
1	32	34	35	36	37	38	39	40

STR22SE 100 A	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	40	42,5	44	45	46,5	47,5	49	50
0.63	50,5	53,5	55,5	57	59	60	62	63
0.7	56	59,5	61,5	63	65	66,5	68,5	70
0.8	64	68	70,5	72	74,5	76	78,5	80
0.9	72	76,5	79	81	83,5	85,5	88	90
1	80	85	88	90	93	95	98	100

STR22SE 160 A	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	64	68	70,5	72	74,5	76	78,5	80
0.63	81	86	89	91	94	96	99	101
0.7	89,5	95	98,5	101	104	106,5	110	112
0.8	102,5	109	112,2	115	119	121,5	125,5	128
0.9	115	122,5	127	129,5	134	137	141	144
1	128	136	141	144	149	152	157	160

STR22SE 250 A	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	100	106	110	112,5	116	119	122,5	125
0.63	126	134	138,5	142	146,5	150	154	157,5
0.7	140	149	154	157,5	163	166	171,5	175
0.8	160	170	176	180	186	190	196	200
0.9	180	191	198	202,5	209	214	220,5	225
1	200	212,5	220	225	232,5	237,5	245	250

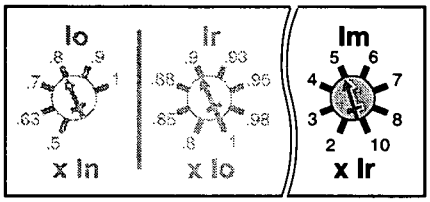
Eg. In 160 A

Io: 0.5 | 0.63 | 0.7 | **0.8** | 0.9 | 1

coarse setting 128 A

Ir: 0.8 | 0.85 | 0.88 | **0.9** | 0.93 | 0.95 | 0.98 | 1

Ir = 128 A x 0.9 = 115 A



Short-circuit protection

Eg. In 160 A

Io: 0.5 | 0.63 | 0.7 | **0.8** | 0.9 | 1

Ir: 0.8 | 0.85 | 0.88 | **0.9** | 0.93 | 0.95 | 0.98 | 1

Ir = 128 A x 0.9 = 115 A

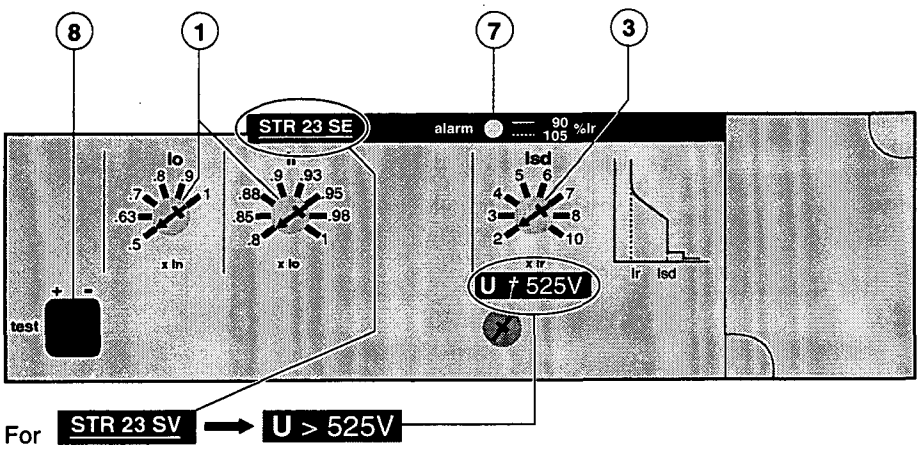
Im: 2 | 3 | 4 | **5** | 6 | 7 | 8 | 10

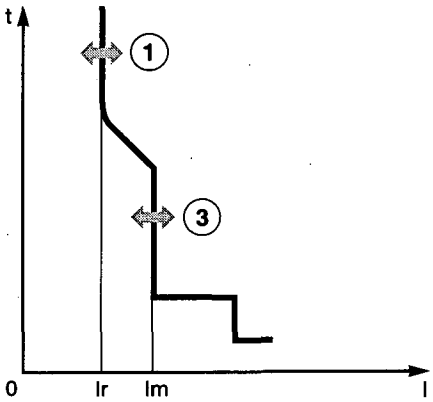
Im = 115 A x 5 = 575 A

With an electronic trip unit, the short circuit threshold is a multiple of the overload setting.

The device trips instantaneously when the current exceeds 575 A.

trip unit settings - details electronic STR23SE, STR23SV



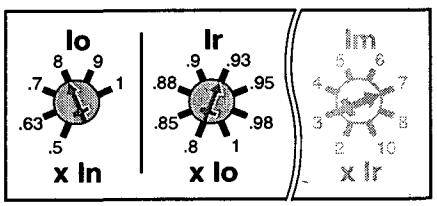


The trip unit rating for STR23SE, STR23SV, STR53SV and STR53UE is fixed by the current transformer within the circuit breaker.

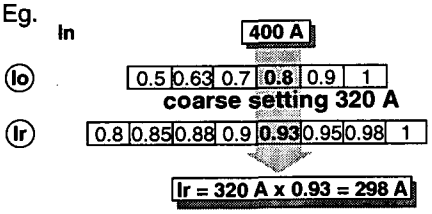
Overload protection

Compact NS400	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	160	170	176	180	186	190	196	200
0.63	202	214	222	227	234	239	247	252
0.7	224	238	246	252	260	256	274	280
0.8	256	272	282	300	298	304	314	320
0.9	288	306	316	324	334	342	352	360
1	320	340	352	360	372	380	392	400

Compact NS630	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	252	268	277	284	293	299	309	315
0.63	318	337	349	357	369	377	389	397
0.7	352	374	388	396	410	418	432	441
0.8	403	428	443	472	469	479	494	504
0.9	453	481	498	510	527	538	555	567
1	504	535	554	567	586	598	617	630

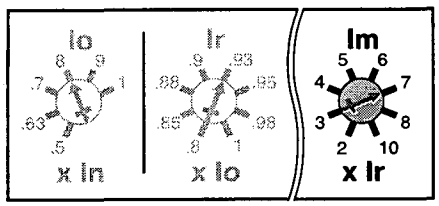


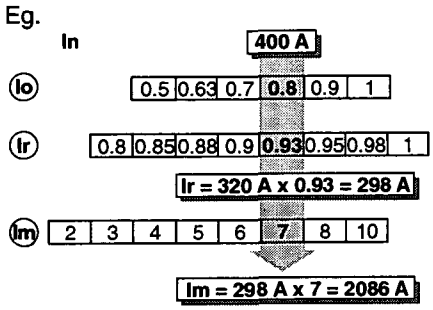
Example of protection settings



Short circuit protection

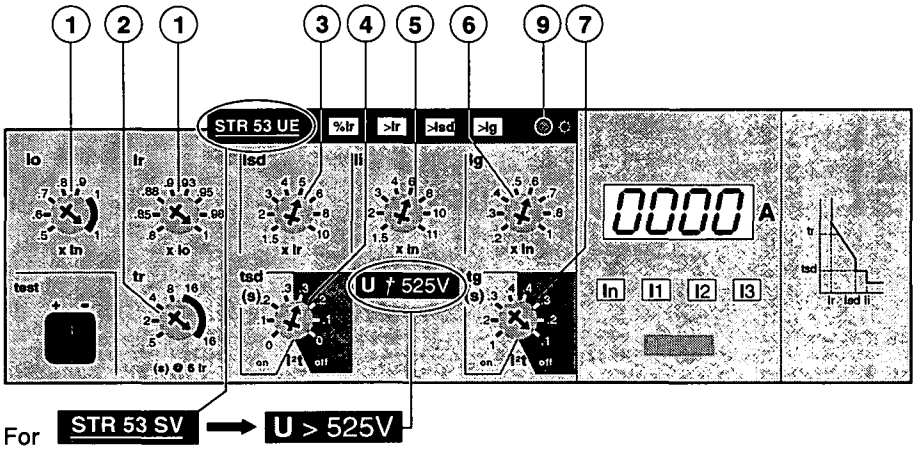
The short circuit threshold is a multiple of the overload setting.

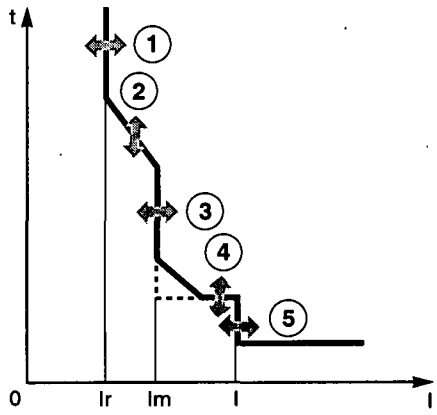




For a NS400 circuit breaker with 400 A CTs, the STR23SE trip unit is calibrated at 400 A

trip unit settings - details
electronic STR53UE and STR53SV





trip unit adjustment STR53UE

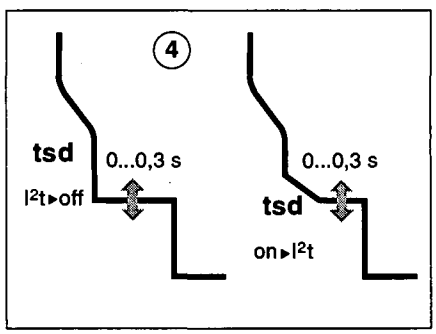
Overload protection

Compact NS400	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	160	170	176	180	186	190	196	200
0.6	192	204	211	216	223	228	235	240
0.7	224	238	246	252	260	266	274	280
0.8	256	272	281	288	297	304	313	320
0.9	288	306	316	324	334	342	352	360
1	320	340	352	360	372	380	392	400
Compact NS630	**Ir (fine adjustment)**							
Io (coarse setting)	**0.8**	**0.85**	**0.88**	**0.9**	**0.93**	**0.95**	**0.98**	**1**
0.5	252	267	277	283	292	299	308	315
0.6	302	321	332	340	351	359	370	378
0.7	352	374	388	396	410	418	332	441
0.8	403	428	443	453	468	478	493	504
0.9	453	481	498	510	527	538	555	567
1	504	535	554	567	585	598	617	630

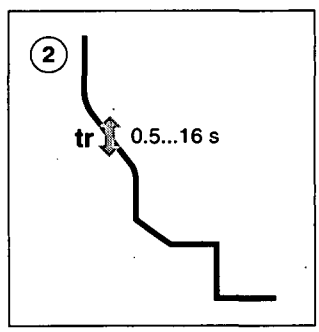
Trip unit STR53UE provides an even finer balance between safety and service continuity for installations with special characteristics (for example induction furnaces, fluorescent lighting, arc-welding systems, SCR-based regulation systems, etc.), by the use of three additional settings:

- instantaneous tripping threshold (I);
- overload protection delay (tr);
- short circuit protection delay (tm).

Short circuit time delay

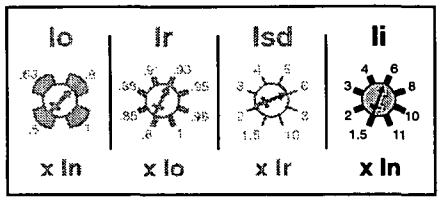


Overload time delay

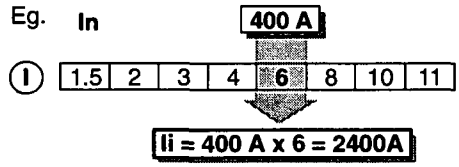


tr is given at 6 Ir

Options : see page 23.



Increased short circuit protection with the adjustable instantaneous threshold, I



The tripping time is faster than that of the short circuit time delay. The threshold is a function of the **circuit breaker rating.**

increased setting range with 150 and 250 A CTs

trip unit adjustment STR23SE / STR23SV

Overload protection

NS400 (150 A)	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	60	63,76	66	67,5	69,75	71,25	73,5	75
0.63	75,6	80,32	83,16	85,05	87,88	89,77	92,61	94,5
0.7	84	89,25	92,4	94,5	97,65	99,75	102,9	105
0.8	96	102	105,6	138	111,5	114	117,6	120
0.9	108	114,75	118,8	121,5	125,55	128,55	132,5	135
1	120	127,5	132	135	139,5	142,5	147	150

NS400 (250 A)	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	100	106,25	110	112,5	116,25	118,75	122,5	125
0.63	126	133,87	138,6	141,75	146,57	149,62	154,35	157,6
0.7	140	148,75	154	157,5	162,75	166,25	171,5	175
0.8	160	170	176	180	185	190	196	200
0.9	180	191,25	198	202,5	209,25	213,75	220,5	225
1	200	212,2	220	225	232,5	237,5	245	250

trip unit adjustment STR53UE / STR53SV

Overload protection

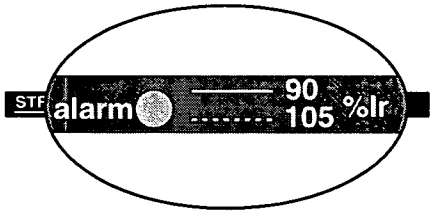
NS400 (150 A)	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	100	106	110	112	116	118	122	125
0.6	120	127	132	135	139	142	147	150
0.7	140	148	154	157	162	166	171	175
0.8	160	170	176	180	186	190	196	200
0.9	180	191	198	202	209	213	220	225
1	200	212	220	225	232	237	245	250

NS400 (250 A)	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	60	63	66	67	69	71	73	75
0.6	72	76	79	81	83	85	88	90
0.7	84	89	92	94	97	99	102	105
0.8	96	102	105	108	111	114	117	120
0.9	108	114	118	121	125	128	132	135
1	120	127.5	132	135	139	142	147	150

remote indication and electronic trip unit options STR22SE, STR23SE, STR23SV, STR53UE, STR53SV

indication

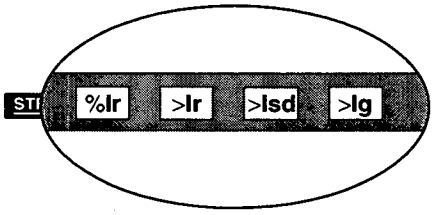
alarm LED STR22SE and STR23SE



For Compact NS100/160/250: STR22SE or STR23SE
The LED lights and remains lit when the load exceeds 90 % of Ir.

The LED blinks for an overload (≥ 105% Ir), warning that the circuit breaker may trip.

STR53UE/SV



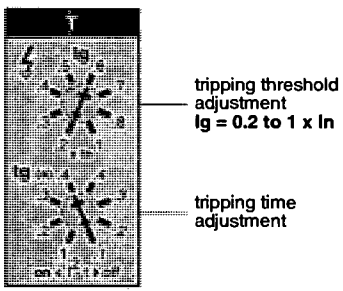
For Compact NS400/630: STR53UE or STR53SV
Overload indications (%Ir)
- LED goes on when the current exceeds 0.9Ir;
- LED flashes when the current exceeds the long-time thresholds Ir.

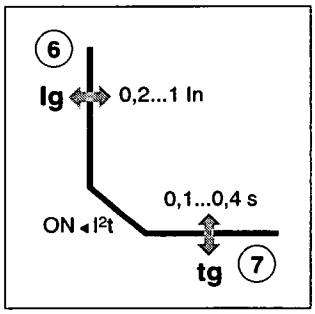
Fault indications

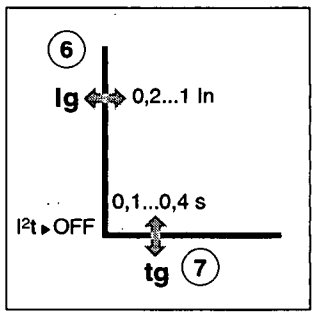
LEDs indicate the type of fault that caused tripping:
- overload (LT protection) ot abnormal component temperature **(>Ir);**
- short-circuit (ST or instantaneous protection) **(>Isd);**
- microprocessor malfunction (both **(>Ir)** and **(>Isd)** LEDs go on, plus the **(>Ig)** LED if the earth fault protection option is present).

When a fault occurs, the LED indicating the type of fault goes of after about 10 minutes to preserve battery power. The information is however stored in memory and the LED can be re-illuminated by pressing the battery/LED test pushbutton. The LED automatically goes off and the memory is cleared when the circuit breaker is reset

options for STR53UE





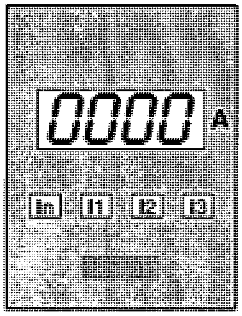


Earth fault protection - option T
This function will trip the circuit breaker in the event of a fault to earth on a TNS system.

remote indication and electronic trip unit options STR22SE, STR23SE, STR53UE

ammeter (I)

E33945



A digital display continuously indicates the current of the phase with the greatest load. By pressing a scroll button, it is also possible to display successively the readings of I1, I2, I3 and I neutral.
LEDs indicate the phase for which the current is displayed.

Ammeter display limits:

- minimum current ⩾ 0,2 x In (lower currents are not displayed) ;
- maximum current ⩽ 10 x In.

zone selective interlocking (ZSI)

A number of circuit breakers are interconnected one after another by a pilot-wire.
In the event of a short-time or earth fault:

- if a given trip unit STR53UE detects the fault, it informs the upstream circuit breaker which applies the set time delay;
- if the trip unit STR53UE does not detect the fault, the upstream circuit breaker trips after its shortest time delay.

In this way, the fault is cleared rapidly by the nearest circuit breaker. In addition, the thermal stresses on the circuits are minimised and time discrimination is maintained throughout the installation.

The trip unit STR53UE can only handle the downstream end of a zone selective interlocking function. Consequently, the zone selective interlocking option cannot be implemented between two Compact NS circuit breakers.

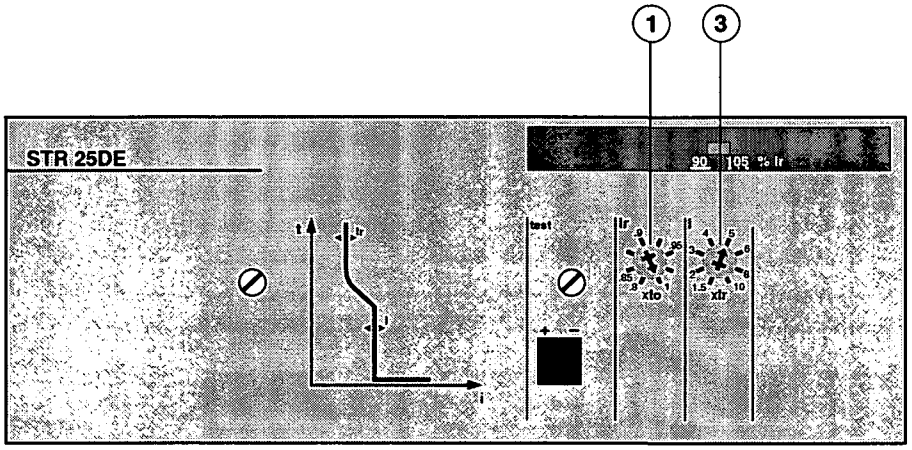
Opto-electronic outputs
The use of opto-transistors ensures total isolation between the internal circuits of the trip unit and the circuits wired by the user.

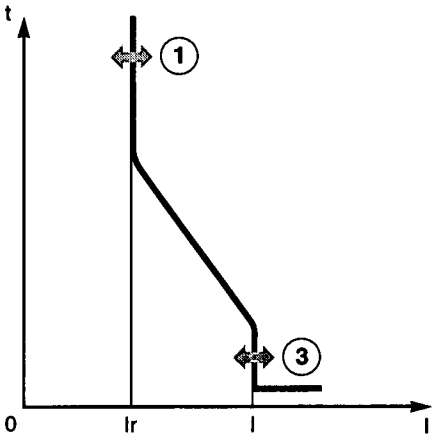
communication (COM)

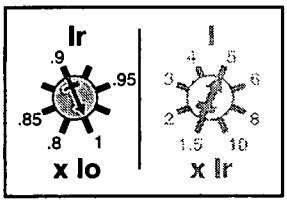
Transmission of data to Digipact distribution monitoring and control modules.
Transmitted data:

- settings;
- phase and neutral currents (rms values);
- highest current of the three phases;
- overload condition alarm;
- cause of tripping (overload, short-circuit, etc.).

trip unit settings - details electronic STR25DE

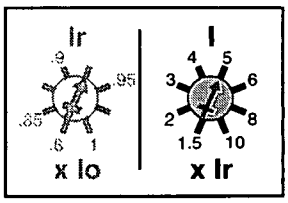




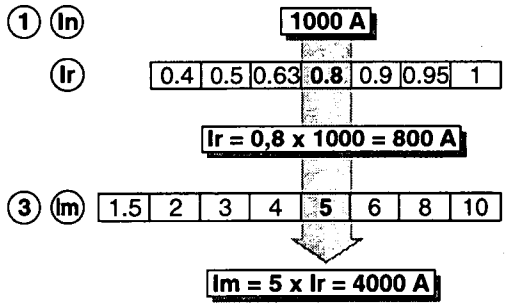


Setting STR25DE

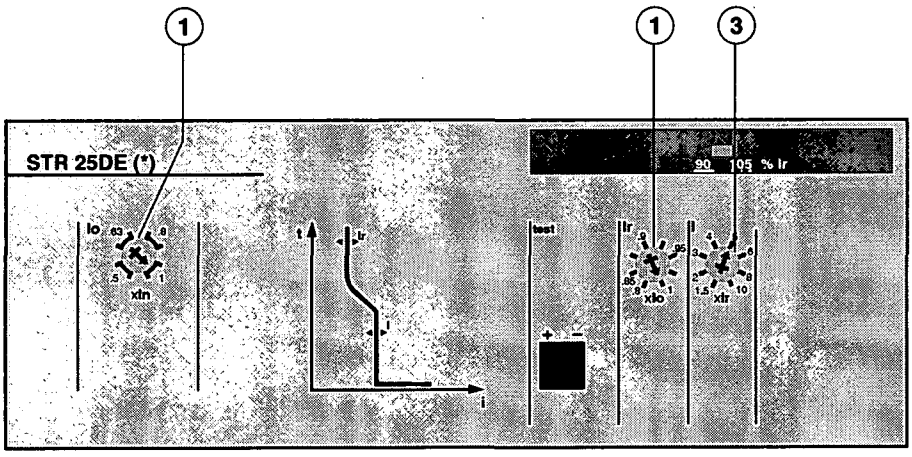
Compact C801N/H/L	**In = 800 A**							
setting ①	**1**	**0.95**	**0.9**	**0.8**	**0.7**	**0.63**	**0.5**	**0,4**
Ir (A)	800	760	720	640	560	504	400	320
Compact C1001N/H/L	**In = 1000 A**							
setting ①	**1**	**0.95**	**0.9**	**0.8**	**0.7**	**0.63**	**0.5**	**0,4**
Ir (A)	1000	950	900	800	700	630	500	400
Compact C1251N/H/L	**In = 1250 A**							
setting ①	**1**	**0.95**	**0.9**	**0.8**	**0.7**	**0.63**	**0.5**	**0,4**
Ir (A)	1250	1187	1125	1000	875	787	625	500



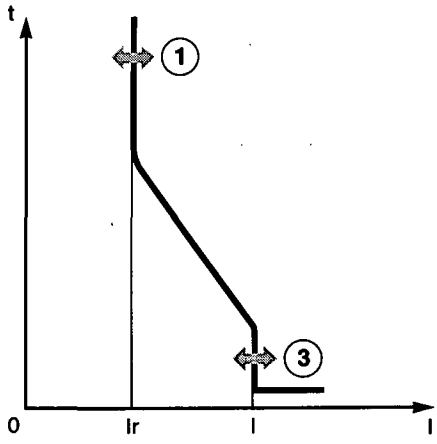
Example :
In = 1000 A,
Ir = 800 A
Im = 4000 A

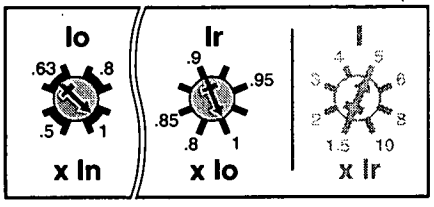


trip unit settings - details
electronic STR25DE (*) (fine adjustment)



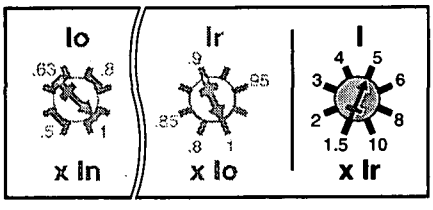
(*) fine adjustment



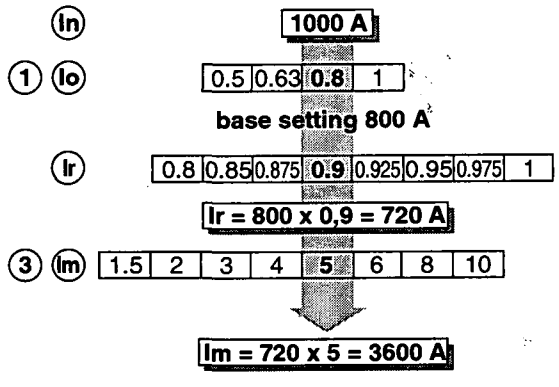


Setting STR25DE (*)

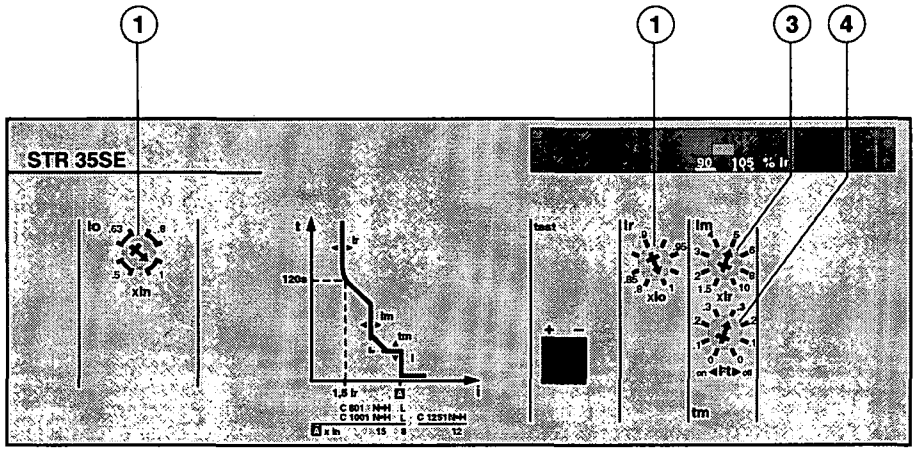
Compact C801N/H/L (1)	In = 800 A							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0.8
0,5	400	390	380	370	360	350	340	320
0,63	504	491	479	466	454	441	428	403
0,8	640	624	608	592	576	560	544	512
1	800	780	760	740	720	700	680	640
Compact C1001N/H/L (1)	**In = 1000 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0.8
0,5	500	488	475	463	450	438	425	400
0,63	630	614	599	583	567	551	536	504
0,8	800	780	760	740	720	700	680	640
1	1000	975	950	925	900	875	850	800
Compact C1251N/H/L (1)	**In = 1250 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0.8
0,5	625	609	594	578	563	547	531	500
0,63	788	768	748	728	709	689	669	630
0,8	1000	975	950	925	900	875	850	800
1	1250	1219	1188	1156	1125	1094	1063	1000

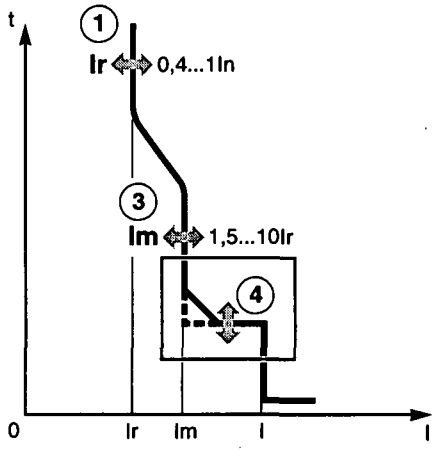


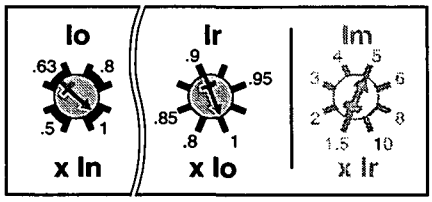
Example :
C1001N : In = 1000 A,
Ir = 720 A,
Im = 3600 A,



trip unit settings - details electronic STR35SE/GE

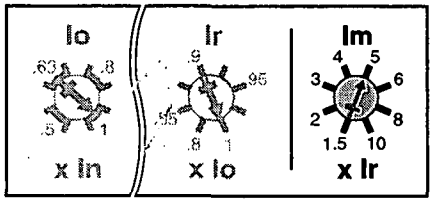




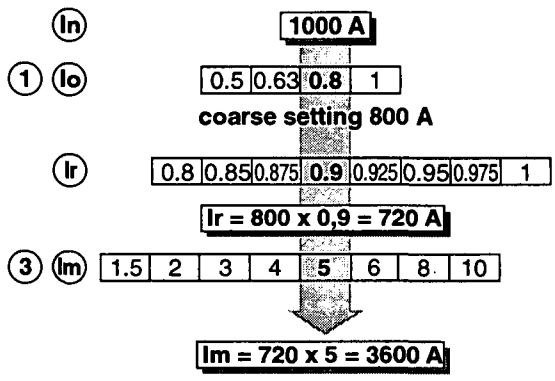


Setting STR35SE/GE

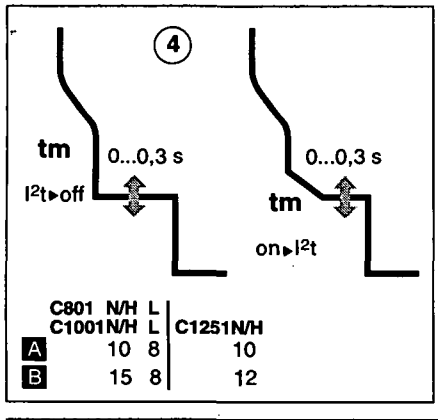
Compact C801N/H/L (1)	In = 800 A							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	400	390	380	370	360	350	340	320
0,63	504	491	479	466	454	441	428	403
0,8	640	624	608	592	576	560	544	512
1	800	780	760	740	720	700	680	640
Compact C1001N/H/L (1)	**In = 1000 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	500	488	475	463	450	438	425	400
0,63	630	614	599	583	567	551	536	504
0,8	800	780	760	740	720	700	680	640
1	1000	975	950	925	900	875	850	800
Compact C1251N/H/L (1)	**In = 1250 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	625	609	594	578	563	547	531	500
0,63	788	768	748	728	709	689	669	630
0,8	1000	975	950	925	900	875	850	800
1	1250	1219	1188	1156	1125	1094	1063	1000



Example :
C1001N : In = 1000 A,
Ir = 720 A,
Im = 3600 A,

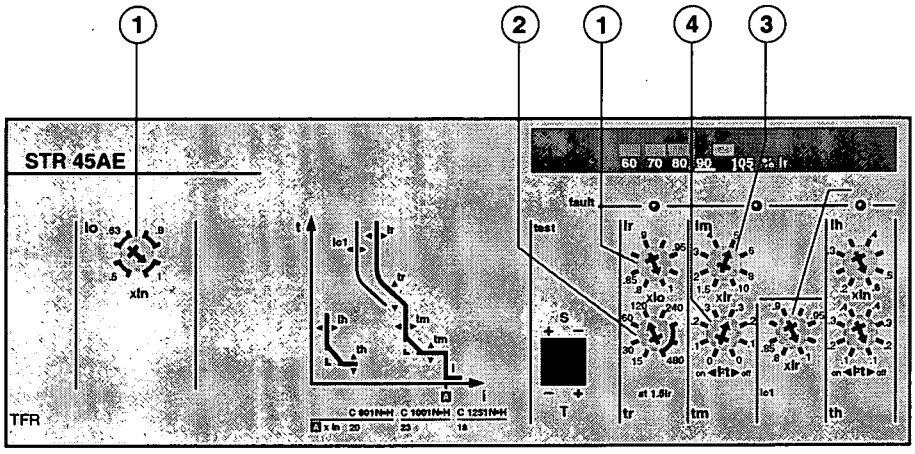


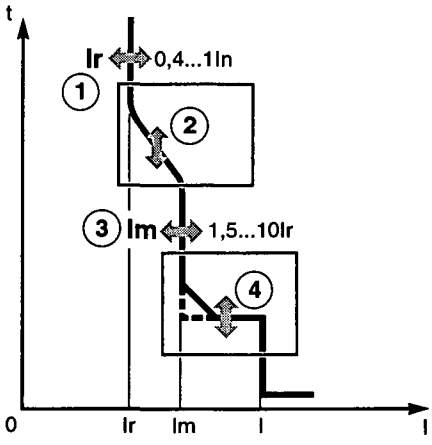
Short circuit time delay

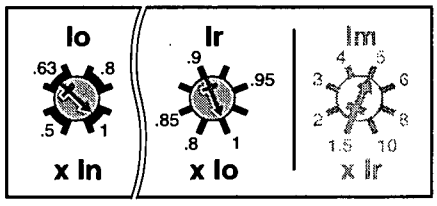


	C801 N/H L / C1001 N/H L	C1251N/H
A	10 8	10
B	15 8	12

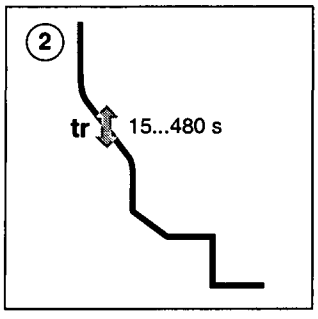
trip unit settings - details
electronic STR45AE





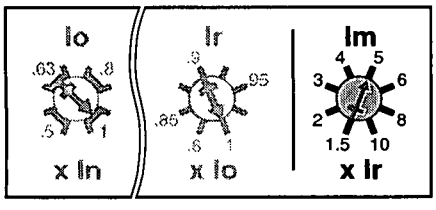


Overload time delay

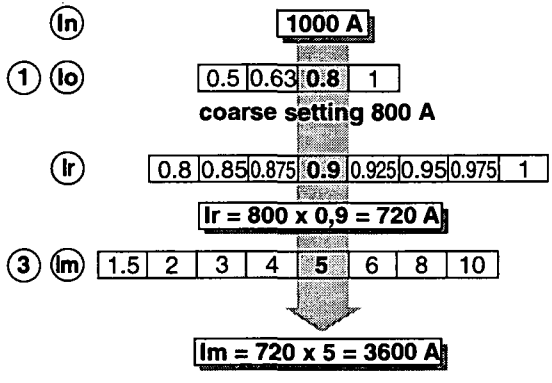


SettingSTR45AE

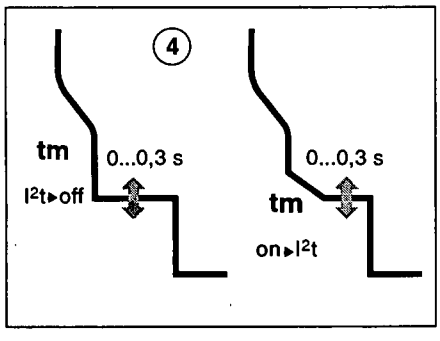
Compact C801N/H/L (1)	In = 800 A							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	400	390	380	370	360	350	340	320
0,63	504	491	479	466	454	441	428	403
0,8	640	624	608	592	576	560	544	512
1	800	780	760	740	720	700	680	640
Compact C1001N/H/L (1)	**In = 1000 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	500	488	475	463	450	438	425	400
0,63	630	614	599	583	567	551	536	504
0,8	800	780	760	740	720	700	680	640
1	1000	975	950	925	900	875	850	800
Compact C1251N/H/L (1)	**In = 1250 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	625	609	594	578	563	547	531	500
0,63	788	768	748	728	709	689	669	630
0,8	1000	975	950	925	900	875	850	800
1	1250	1219	1188	1156	1125	1094	1063	1000



Example :
C1001N : In = 1000 A,
Ir = 720 A,
Im = 3600 A,

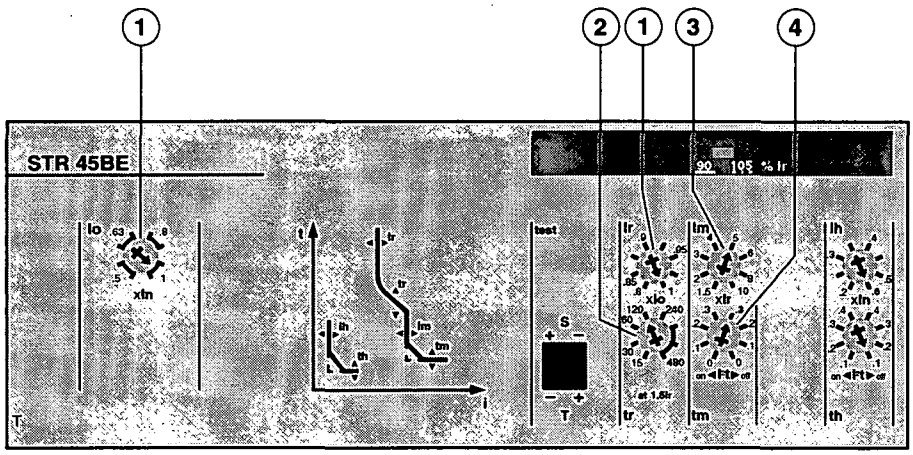


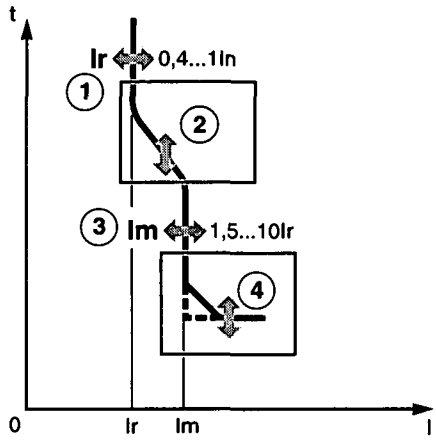
Short circuit time delay

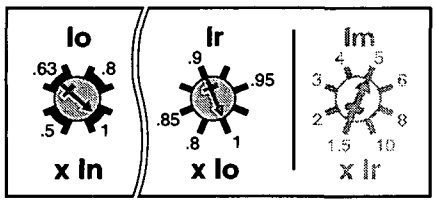


Options : see page 31

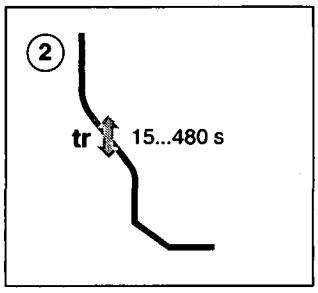
trip unit settings - details electronic STR45BE





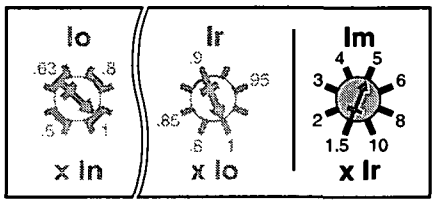


Overload time delay

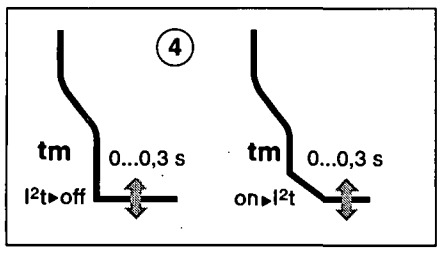


Setting STR45BE

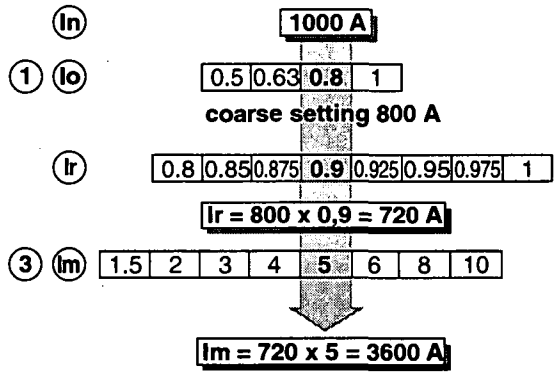
Compact C801N/H/L (1)	In = 800 A							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	400	390	380	370	360	350	340	320
0,63	504	491	479	466	454	441	428	403
0,8	640	624	608	592	576	560	544	512
1	800	780	760	740	720	700	680	640
Compact C1001N/H/L (1)	**In = 1000 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	500	488	475	463	450	438	425	400
0,63	630	614	599	583	567	551	536	504
0,8	800	780	760	740	720	700	680	640
1	1000	975	950	925	900	875	850	800
Compact C1251N/H/L (1)	**In = 1250 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	625	609	594	578	563	547	531	500
0,63	788	768	748	728	709	689	669	630
0,8	1000	975	950	925	900	875	850	800
1	1250	1219	1188	1156	1125	1094	1063	1000



Short circuit time delay

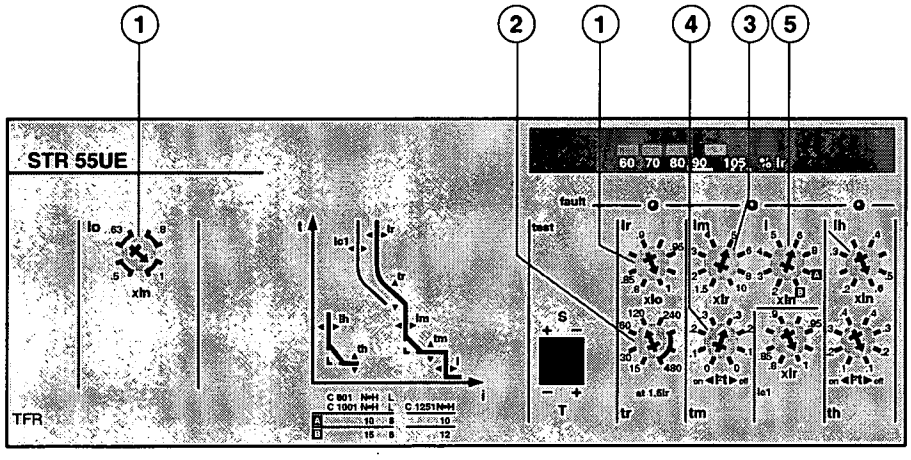


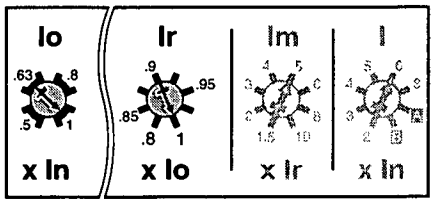
Example :
C1001N : In = 1000 A,
Ir = 720 A,
Im = 3600 A,



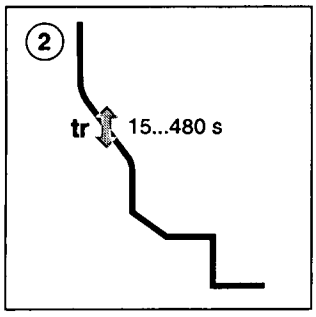
Options : see page 31

trip unit settings - details
electronic STR55UE



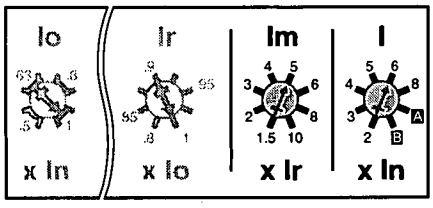


Overload time delay

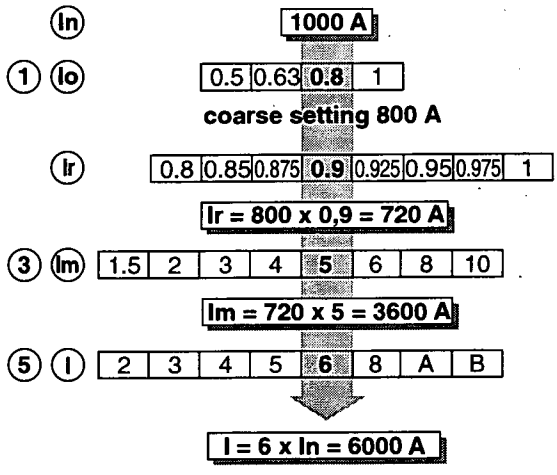


Setting STR55UE

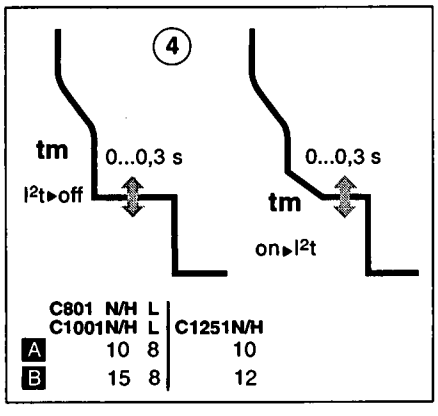
Compact C801N/H/L (1)	In = 800 A							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	400	390	380	370	360	350	340	320
0,63	504	491	479	466	454	441	428	403
0,8	640	624	608	592	576	560	544	512
1	800	780	760	740	720	700	680	640
Compact C1001N/H/L (1)	**In = 1000 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	500	488	475	463	450	438	425	400
0,63	630	614	599	583	567	551	536	504
0,8	800	780	760	740	720	700	680	640
1	1000	975	950	925	900	875	850	800
Compact C1251N/H/L (1)	**In = 1250 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	625	609	594	578	563	547	531	500
0,63	788	768	748	728	709	689	669	630
0,8	1000	975	950	925	900	875	850	800
1	1250	1219	1188	1156	1125	1094	1063	1000



Example :
C1001N : In = 1000 A,
Ir = 720 A,
Im = 3600 A,
I = 6000 A



Short circuit time delay

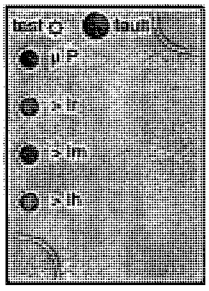


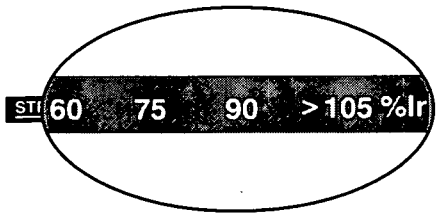
Options : see page 31

remote indication and electronic trip unit options STR45AE/BE, STR55UE

indication

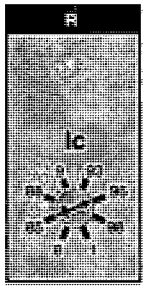
LED alarme

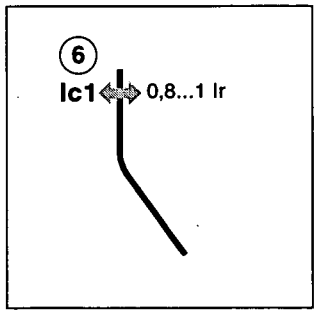


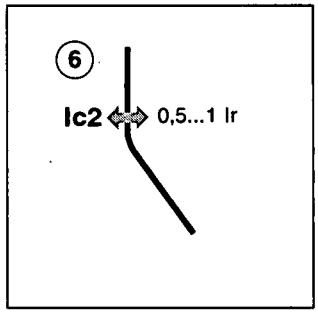


Fault indication - option F
this option is not available on the STR45BE.

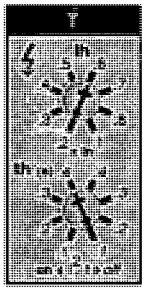
STR45AE/BE STR55UE options

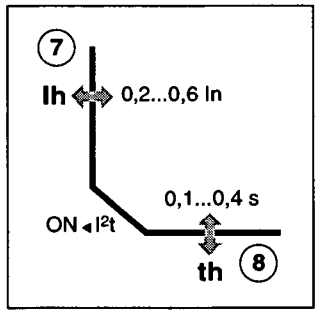


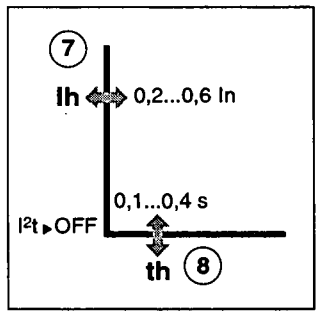




Load shedding control - option R
(6) Ic1 = 0,8 to 1
Ic2 = 0,5 to 1







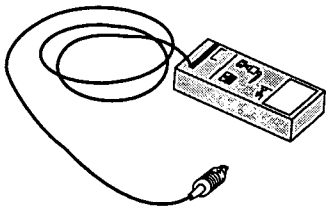
Earth fault protection - option T
earth fault protecyion setting for your network
(7) Ih = 0,2 to 0,6 In
I²t = constant : ON or OFF

(8) th = 0,1 to 0,4 s

testing of electronic trip units STR22SE, STR23SE, STR53UE, STR25DE, STR35SE/GE STR45AE/BE, STR55UE

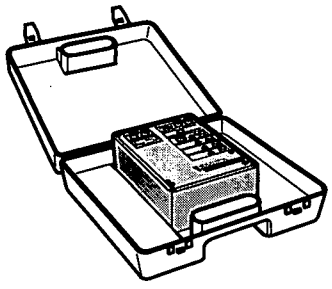
testing of electronic trip units

mini test kit



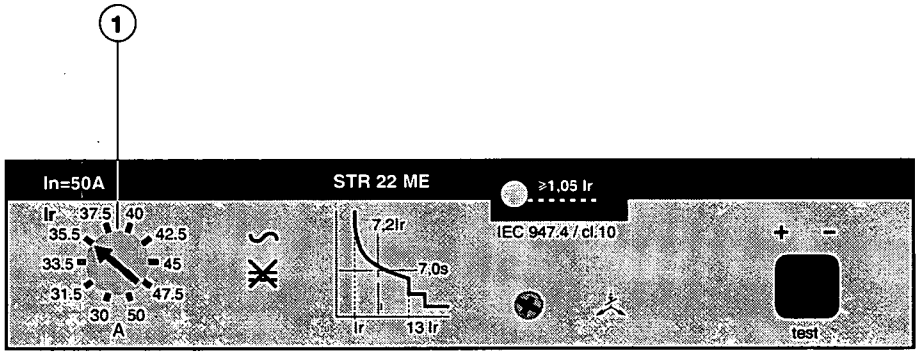
A test socket on the front of the electronic trip units enables connection to a mini test kit or calibration test kit. These kits tests trip unit operation and circuit breaking tripping.

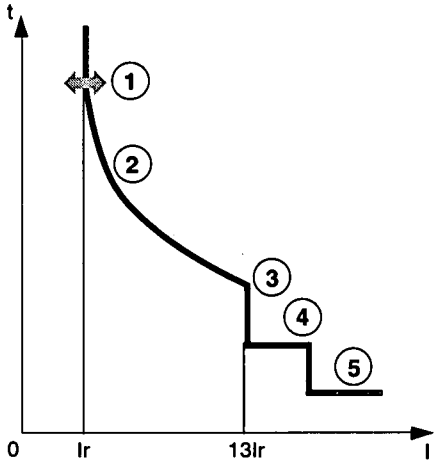
calibration test kit



The calibration test kit checks the protection systems by measuring the real tripping times at any point of the tripping curve.
This device checks that the trip unit is operational and that the breaker will trip according to the tripping curve.

trip unit settings - details
electronic STR22ME, STR35ME
for motor protection



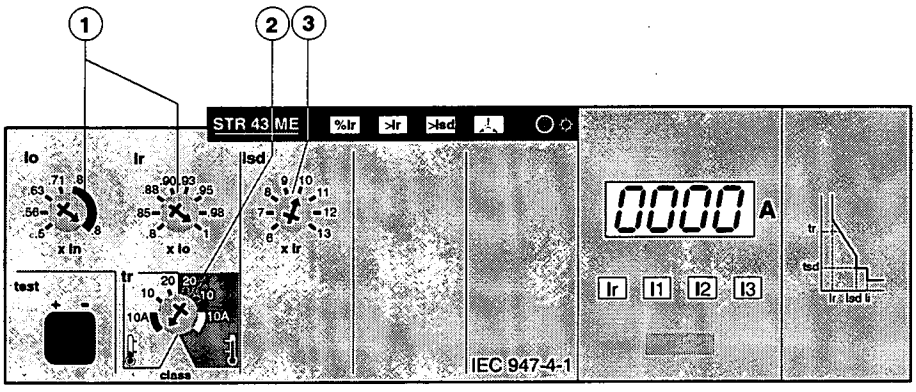


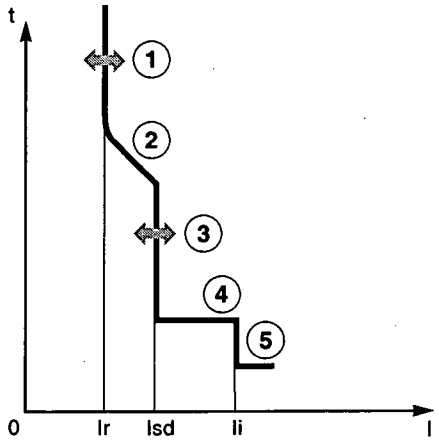
Protection settings (STR22ME)
- overload protection, adjustable threshold Ir (1),
conformes to tripping class 10 according to IEC 947-4-1 (2);
- protection against single phase operation : initiates circuit breaker opening in 3.5 to 6 s ;
- short circuit protection :
  - fixed threshold, Im (13 x Ir) (3),
  - fixed time delay (4).
- instantaneous protection against high short circuits, fixed threshold (13 x In) (5).

Indication as standard
Indication of load by diode on front face :
- non operational for I < 1.05 x In ;
- flashes for I ⩾ 1.05 x In.

trip unit STR22ME										
rating(A)	adjustment thresholds (A)									
20	12	12.6	13.4	14.2	15	16	17	18	19	20
25	15	15.7	16.7	17.7	18.7	20	21.2	22.5	23.5	25
40	24	25.5	27	28.5	30	32	34	36	38	40
50	30	31.5	33.5	35.5	37.5	40	42.5	45	47.5	50
80	48	51	54	57	60	64	68	72	76	80
100	60	63	67	71	75	80	85	90	95	100
150	90	95	101	107	113	120	127	135	142	150
220	132	140	148	157	166	177	187	198	209	220

trip unit settings - details electronic STR43ME for motor protection





Protection settings (STR43ME)

- overload protection :
  - adjustable threshold, Ir (1),
  - adjustable long time delay (2),

conformes to trip unit classes types 5, 10 and 20 according to IEC 947-4.1 ;

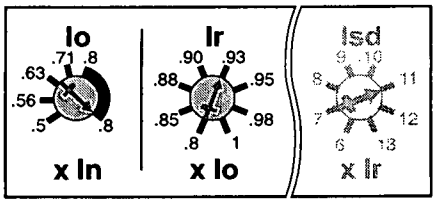
- protection against single phase operation : initiates circuit breaker opening in 4 s ± 10% ;
- short circuit protection :
  - adjustable threshold, Im (6 to 13 x Ir) (3),
  - fixed time delay (4);
- instantaneous protection against high short circuits, fixed threshold (13 x In) (5).

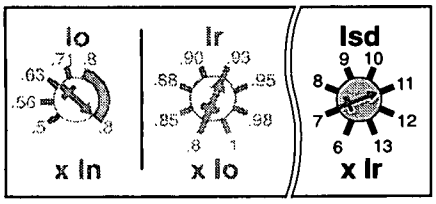
Overload protection settings

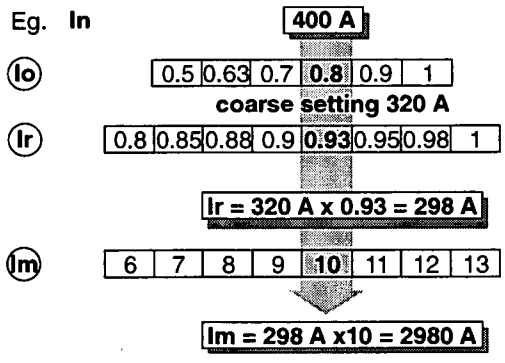
Compact NS400	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	160	170	176	180	186	190	196	200
0.56	180	190	197	202	208	215	220	224
0.63	202	214	222	227	234	239	247	252
0.7	224	238	246	252	260	256	274	280
0.8	256	272	282	300	298	304	314	320

Compact NS630	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	252	268	277	284	293	299	309	315
0.56	282	300	310	318	328	335	346	353
0.63	318	337	349	357	369	377	389	397
0.7	352	374	388	396	410	418	432	441
0.8	403	428	443	472	469	479	494	504

Example ofprotection settings





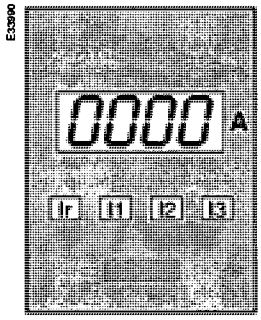


Increased setting range with 150-250 A CTs

NS400 (150 A)	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	60	63.76	66	67.5	69.75	71.25	73.5	75
0.56	67.2	71.4	73.92	75.6	78.12	79.8	82.32	84
0.63	75.6	80.32	83.16	85.05	87.88	89.77	92.61	94.5
0.7	84	89.25	92.4	94.5	97.65	99.75	102.9	105
0.8	96	102	105.6	138	111.5	114	117.6	120
NS400 (250 A)	Ir (fine adjustment)							
Io (coarse setting)	0.8	0.85	0.88	0.9	0.93	0.95	0.98	1
0.5	100	106.25	110	112.5	116.25	118.75	122.5	125
0.56	112	119	123.2	126	130.2	133	137.2	140
0.63	126	133.87	138.6	141.75	146.57	149.62	154.35	157.6
0.7	140	148.75	154	157.5	162.75	166.25	171.5	175
0.8	160	170	176	180	185	190	196	200

options for trip unit STR43ME

ammeter (I)



A digital display continuously indicates the current of the phase with the greatest load.
By pressing a scroll button, it is also possible to display successively the readings of I1, I2, I3 an the long time threshold setting Ir.
LEDs indicate the phase or setting for which the current is displayed.

Ammeter display limits:
- minimum current ≥ 0,2 x In (lower currents are not displayed) ;
- maximum current ≤ 10 x In.

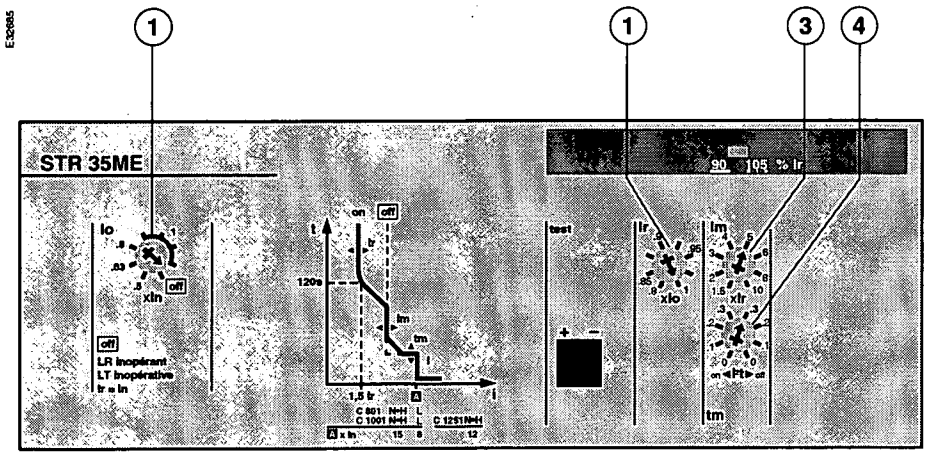
contactor tripping module (SDTAM)

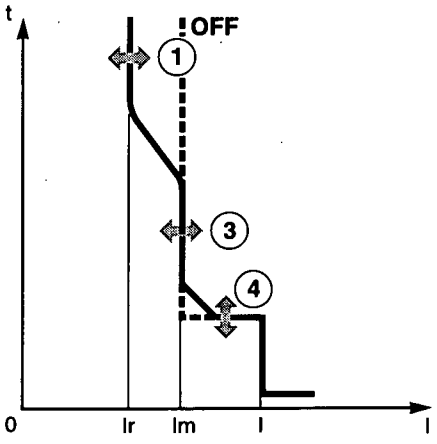
- opens the contactor in the event of an overload. It is thus possible to differentiate between tripping due to overloads and short-circuits;
- may also be used to signal a thermal fault;
- must be reset manually (locally or remotely);
- compatible with the following control voltages:
  - 24 to 72 V DC and 24 to 48 V AC,
  - 110 to 240 V AC / DC;
- fits in place of the MN and MX auxiliary voltage releases.

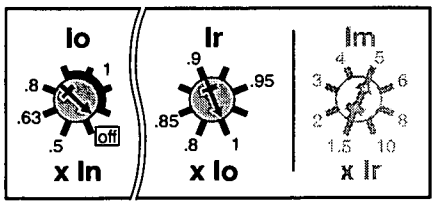
communication (COM)

Transmission of data to Digipact distribution monitoring and control modules.
Transmitted data:
- settings;
- phase currents (rms values);
- highest current of the three phases;
- overload condition alarm;
- cause of tripping (overload, short-circuit, etc.).

trip unit settings - details electronic STR35ME for motor protection

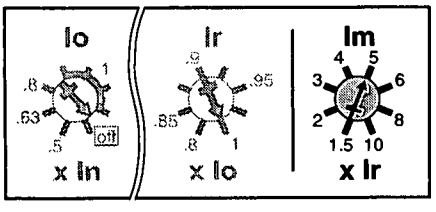




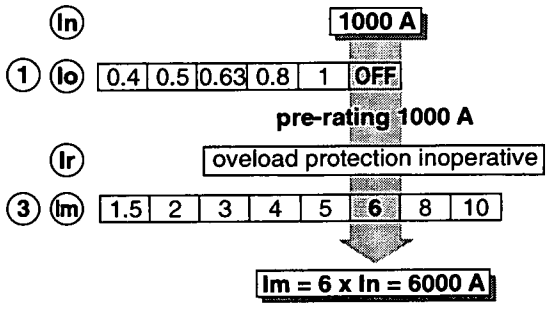


Settings STR35ME

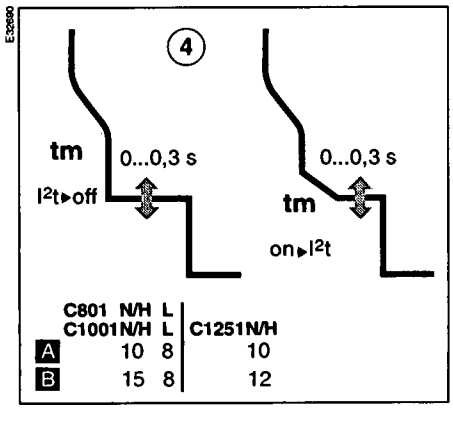
Compact C801N/H/L (1)	In = 800 A							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	400	390	380	370	360	350	340	320
0,63	504	491	479	466	454	441	428	403
0,8	640	624	608	592	576	560	544	512
1	800	780	760	740	720	700	680	640
Compact C1001N/H/L (1)	**In = 1000 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	500	488	475	463	450	438	425	400
0,63	630	614	599	583	567	551	536	504
0,8	800	780	760	740	720	700	680	640
1	1000	975	950	925	900	875	850	800
Compact C1251N/H/L (1)	**In = 1250 A**							
Io \ Ir	1	0.975	0.95	0.925	0.9	0.875	0.85	0,8
0,5	625	609	594	578	563	547	531	500
0,63	788	768	748	728	709	689	669	630
0,8	1000	975	950	925	900	875	850	800
1	1250	1219	1188	1156	1125	1094	1063	1000



Example :
C1001N : In = 1000 A,
Im = 6000 A,



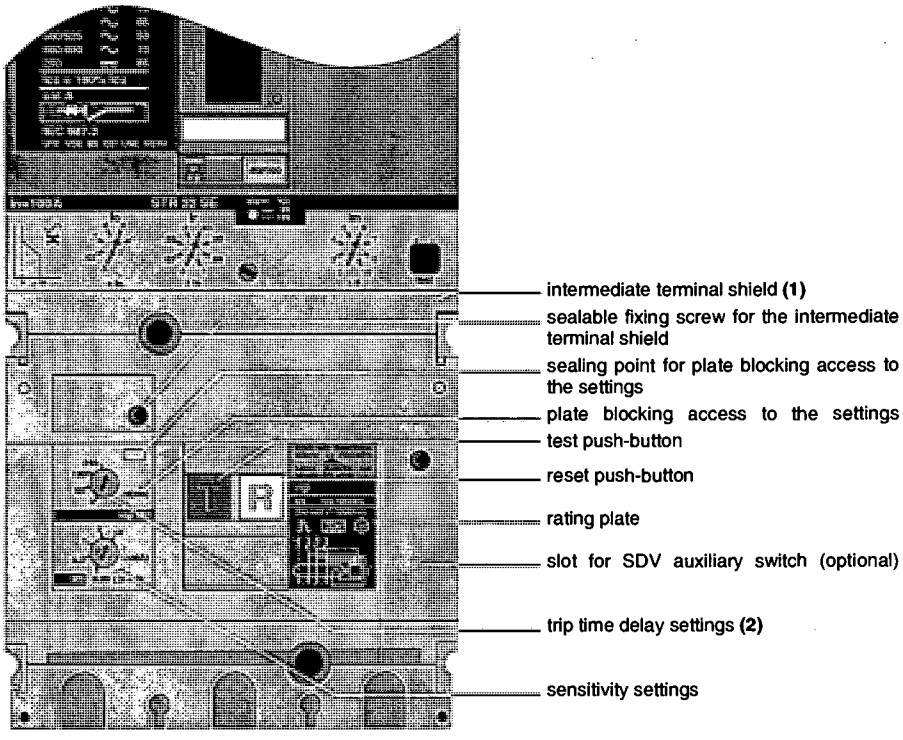
Short circuit time delay



supplementary functions

Vigi bloc and Visu bloc

Vigi bloc



The Vigi bloc provides residual current protection against indirect contact and the risk of fire and destruction due to faults to earth. It actuates the trip unit by means of a direct mechanical action.
The Vigi bloc can be fitted with an alarm contact (SDV) which can be used to remotely indicate that the device has tripped due to an earth fault .
The "**Test**" push button allows regular verification that the Vigi bloc is operational by simulating an earth fault.
The test cannot be carried out with the circuit braker in the open position.
The "**Reset**" push button. After all trips initiated by the Vigi, this button must be pressed in order to reset the Vigi.

(1) The intermediate terminal shield is necessary in order for the Vigi to function.
(2) When the device is set to 30mA, any time delay selected is nullified i.e. instantaneous operation.

rating plate

type of Vigi module
operational voltage and frequency
standardised symbols: **(see page 4)**
immunity to current 8/20 wave and electromagnetic environment
class A immunity to DC components (6 mA insensitivity)
minimum operating temperature as per VDE 664
schematic diagram

the Visu bloc

The standard fixed versions of the Compact circuit breakers exist in ratings 100 A to 1250 A. A Visu bloc can be directly connected, which provides visible break isolation according to French standard NF C 13.100 : the contacts are visibles through a transparent cover, and are operated by means of a handle.
The Visu bloc is padlockable as standard with barrel locking optional.
Specific auxiliaries are available for the Visu bloc : auxiliary contacts, terminal shields, etc.
The Compact NS100/630 and C801/ 1251 can be equiped, as an option, with a pre-tripping mechanism preventing the "on-load" opening of the Visu bloc.

The Visu bloc must be fitted with a CAM contact and the circuit breaker with a voltage release.

Connection

■ fixed front connected. The Compact circuit breakers with Visu bloc are delivered ready for connection by bars or cables fitted with lugs;
■ connection of bare cables : upstream by a set of terminals for the Visu bloc and downstream a set of teminals for the Compact;
□ accessories : the Visu bloc can be fitted with terminal spreaders, right angle terminals, terminal extensions and lugs.
■ fixed rear connected : by adaptation of the Compact's specific rear connectors with the Visu bloc, delivered per pole.

The Compact circuit breakers with Visu bloc can be fitted with specific short terminal shields (rear connection) or standard long terminal shields (front connection), both of which are lead sealable.

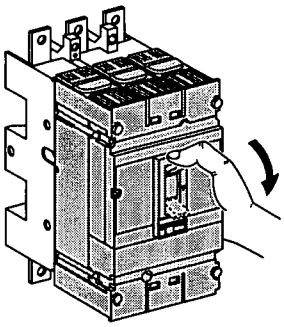
Accessories

Compact NS100/630 with Visu bloc can be fitted with :
■ in the Visu bloc : auxiliary contacts (OF, CAM), Ronis or Profalux barrel locks, a contact to earth the neutral (obligatory if the tansformer neutral is earthed downstream of the Compact with Visu bloc), etc.
■ in the Compact NS frame : all the Compact NS auxiliaries.

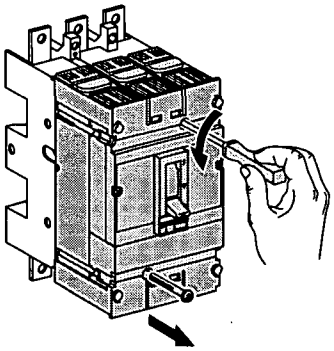
plug-in version

the plug-in circuit breaker

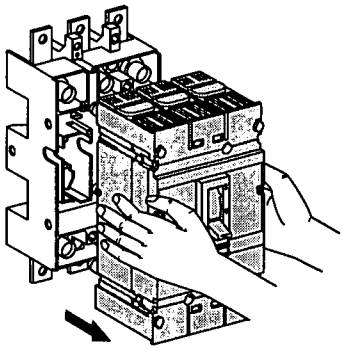
unplugging



1 - open the circuit breaker.



2 - remove the two fixing screws.



3 - pull the circuit breaker out horizontally.

The auxiliary circuits are disconnected by the automatic auxiliary connector block located at the back of the device.

Safety mechanism
If the circuit breaker is closed (I/ON position) when pulled out, advanced opening ensures operator safety, i.e. the poles automatically open before the power connections are withdrawn.

plugging in

1 - open the circuit breaker.

2 - plug the circuit breaker in.

3 - refit the fixing screws.

4 - the circuit breaker is ready for operation.

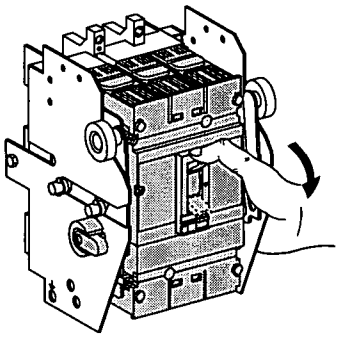
degree of protection against direct contact with the power circuits

- device plugged in: IP40 (with terminal shields),
- device unplugged: IP20,
- device unplugged and base fitted with safety shutters: IP40.

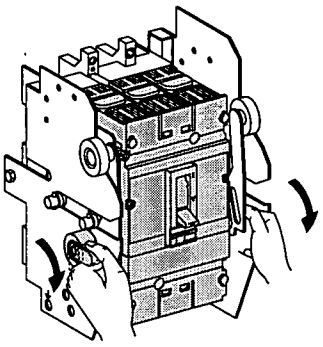
withdrawable chassis for Compact NS100 to 630

chassis mounted plug-in circuit breaker

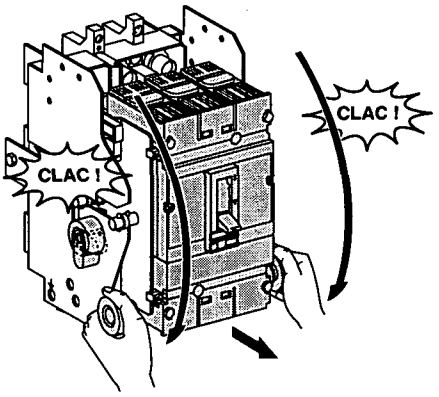
disconnection



1 - open the circuit breaker.



2 - turn the two locking levers.



3 - simultaneously pull down on the two handles until the two locking levers "clack".

the auxiliary circuits are disconnected at the same time as the power circuits, unless the device is equipped with a manual auxiliary connector (see below). Advanced opening ensures operator safety, as with the plug-in version.

removal

1 - disconnect the circuit breaker (as above).
2 - unplug the manual auxiliary connector (if installed).
3 - turn the two locking levers, as for disconnection.
4 - push the two handles down.
5 - pull the circuit breaker out forwards.

connection

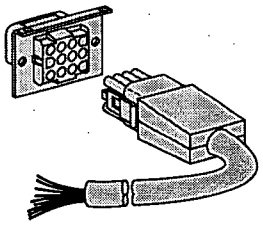
1 - turn the two locking levers.
2 - simultaneouly push up the two handles.

Connection of the auxiliary circuits and circuit breaker advanced opening occur as for disconnection.

degree of protection with circuit breaker disconnected or removed

- no special equipment: IP20,
- base fitted with safety shutters: IP40.

auxiliary circuit test



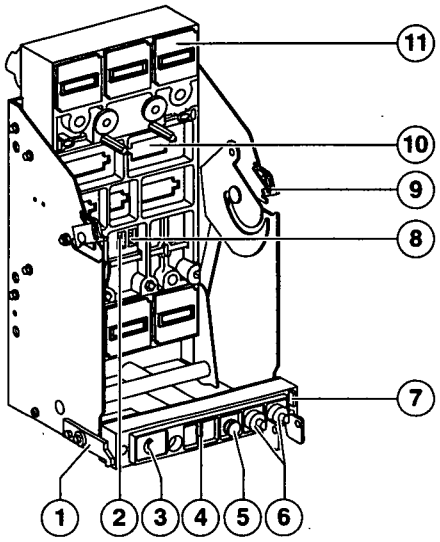
This function is available when the circuit breaker is equipped with the manual auxiliary connector. Following disconnection, the circuit breaker can be operated (toggle, "push to trip" button) to check the auxiliary circuits are still connected.

indication contacts (optional)

Changeover contacts:
- "end-of-connection (fully connected)" contact,
- "end-of-disconnection (fully withdrawn)" contact.

universal chassis for Compact C801 to 1251

the withdrawable circuit breaker and universal chassis



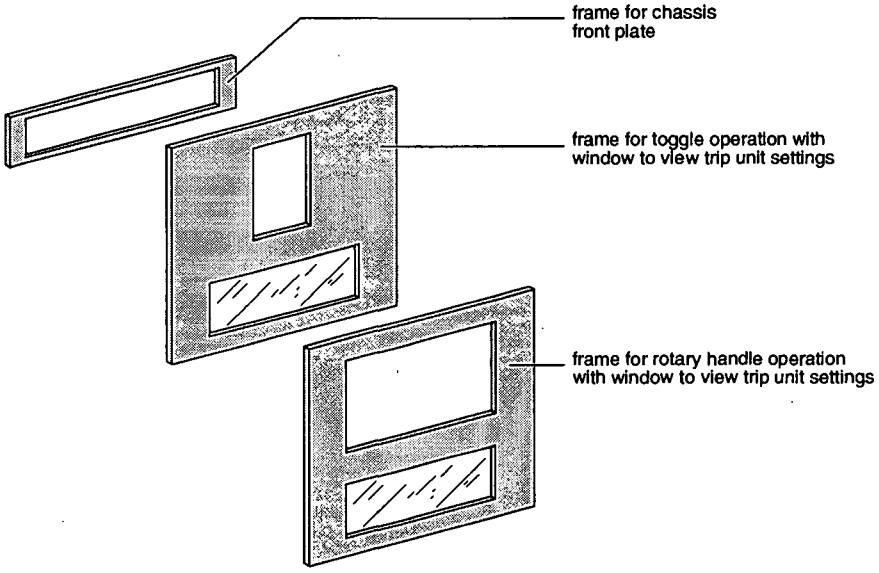
1 door interlocking (optional)
2 2 'racked-out' auxiliary contacts (optional)
3 position indicator
4 locking by 3 padlocks in the 'racked-in' (or 'racked-out') position
5 racking handle storage
6 locking in the withdrawn (or 'racked-out') position (optional)
7 racking interlock (optional)
8 2 'racked-in' auxiliary contacts (optional)
9 extraction operators (1)
10 connector for withdrawable terminal block (optional)
11 safety shutters IP 40 (optional)

The universal chassis for Compact C801 to C1251 is particularly well suited to main incoming circuit breakers :
■ racking in and out is possible with the door closed by means of a racking handle which is normally stored in the base of the chassis ;
■ 2 positions (racked-in and racked-out) are indicated :
□ locally by a position indicator,
□ remotely by auxiliary contacts (2 racked-in contacts and 2 racked-out contacts) ;
■ the circuit breaker can be operated from the exterior of the panel.

Locking
A wide range of locking options :
■ chassis locking in both the racked-in and racked-out positions by 3padlocks and 2 barrel locks, accessable from the panel exterior ;
■ door interlocking, with the breaker racked-in ;
■ can be locked in the racked-in position with the panel door open.

Door cut-out
A set of 'surrounds' allow :
■ optimises the number of cut-outs : only 1 cut-out per circuit breaker :
□ 3 and 4 poles,
□ toggle or direct rotary handle operated ;
■ guarantees a degree of protection to IP 40.
This set comprises :
■ a frame for the chassis front plate, which gives access to the locking facilities and racking mechanism (see below) ;
■ a frame for the circuit breaker handle with window to view trip unit settings.

Fixation
■ rear : panel or rail mounted ;
■ on a shelf : solid or rails.
Power connections
■ by cables with crimped lugs ;
■ by flat or edgewise bars.
Auxiliary connections
The standard Compact C withdrawable terminal block.



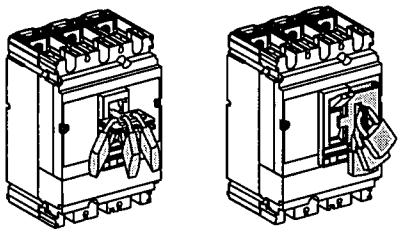
Door front covers and surrounds

locking options

Whatever locking method is chosen, the circuit breaker will always **trip** in the event of a fault.
■ each device is able to accept between 1 and 3 padlocks of diameter 5 to 8 mm.

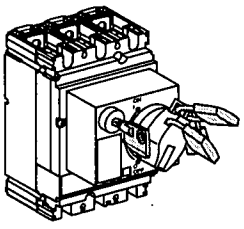
■ locking in the OFF/O position guarantees **isolation** according to IEC 947-2.

toggle



function	means	accessories required	for circuit breaker NS100...630	C801...C1251
locking device in position O	padlock	removable lock. device	■	■
locking device in position O or I	padlock	fixed locking device	■	

standard direct rotary handle



function	means	accessories required	for circuit breaker NS100...630	C801...C1251
locking device position O	padlock	–	■	■
	keylock	locking device and keylock	■	■

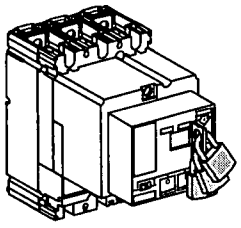
MMC type direct rotary handle

function	means	accessories required	for circuit breaker NS100...630	C801...C1251
locking device position O	padlock	–	■	
device in position I : door opening prevented door open: device closing prevented	rotary handle (integral)	–	■	

extended rotary handle

function	means	accessories required	for circuit breaker NS100...630	C801...C1251
locking in OFF position O	padlock	–	■	■
door opening prevented	keylock			■
device in I position: door opening prevented door open: device closing prevented	rotary handle (integral)	–		

motor mechanism



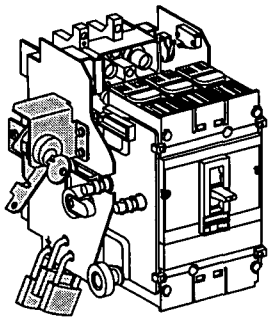
function	means	accessories required	for circuit breaker NS100...630	C801...C1251
locking in OFF position O	padlock	–	■	■
motor mechanism locked out	keylock	1 locking device	■	■

1 - set the selector on the front to the manual position.
2 - pull the locking lever.
3 - fit the padlock(s).

It is then impossible to actuate the spring charging lever, the closing push-button and the manual/automatic operation selector.

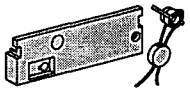
locking and lead sealing

withdrawable chassis



function	means	accessories required
connection prevented	padlock	–
lock in connected or disconnected position	keylock	locking device and keylock

different lead sealing systems

seal		inhibited operations
	front cover fixing screw	■ removal of front cover ■ access to auxiliaries ■ removal of trip unit
	rotary handle fixing screw	■ removal of the rotary handle ■ access to auxiliaries ■ removal of trip unit
	motor mechanism cover locking screw	■ removal of the motor mechanism ■ access to auxiliaries ■ removal of trip unit
	transparent protection plate for trip unit settings	changes in settings: ■ for overload protection ■ for short-circuit protection
	transparent protection plate for Vigi module settings	changes in settings for earth fault protection
	intermediate terminal shield on Vigi module	■ disabling of earth fault protection function ■ access to power connection (protection against direct contact)
	terminal shield fixing screw	access to power connections (protection against direct contact)

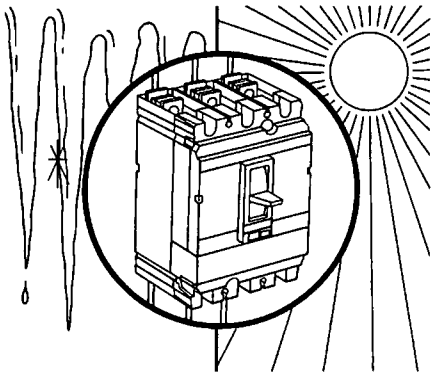
interlocking

Prevents closing of a circuit breaker when another is already closed.

function	means
interlocking of 2 circuit breakers fitted with **toggle**	double-bolt mechanical device
interlocking of 2 circuit breakers fitted with **rotary handle**	mechanical device
	2 keylocks (1 key)

operational conditions

ambient temperature



operation

Ambient temperature between –25°C and +40 °C:
The rated characteristics for Compact NS circuit breakers are guaranteed if the temperature of the air immediately surrounding the device is within the above range.

Ambient temperature between +40°C and +70°C :
Take into account the derating coefficients presented in the technical documents:
- for circuit breakers with a thermal-magnetic trip unit, there is a natural drop in the thermal tripping threshold (overload protection),
- for circuit breakers with an electronic trip unit, there is a drop in the maximum setting authorised for overload protection.

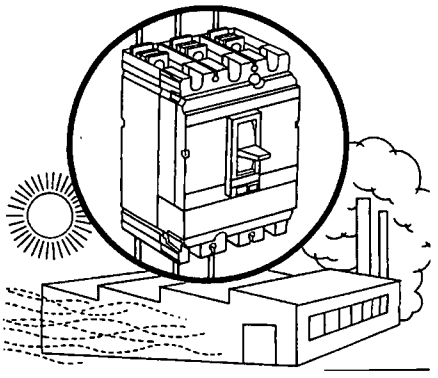
Ambient temperature above +70°C:
Various systems trip the circuit breaker to protect components from the effects of excessive temperature. It follows that continuity of service for the electrical installation is not guaranteed if the circuit breakers operate at temperatures greater than 70°C. Ventilation (natural or forced-air) should be provided for switchboards to avoid temperatures greater than 70°C.

storage and commissioning

In their original packing, Compact NS circuit breakers may be stored at temperatures ranging from **-55°C to +95°C.**

Commissioning should be carried out at normal ambient temperatures (see above). However, commissioning may exceptionally be carried out at an ambient temperature ranging from -35°C to -25°C.

special atmospheric conditions

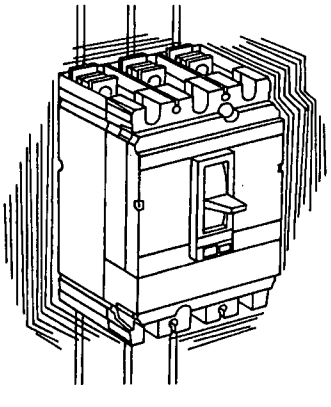


Compact NS circuit breakers operate within their rated characteristics in all normal climatic conditions. They have successfully passed (no drop in rated characteristics) the tests defined by the following standards:
- IEC 68-2-2 : dry heat at +85°C,
- IEC 68-2-1 : dry cold at –55°C,
- IEC 68-2-30 : damp heat (temperature + 55°C, relative humidity 95 %),
- IEC 68-2-11 : salt spray.

Compact NS circuit breakers are designed to operate in industrial atmospheres as defined in IEC standard 947 (pollution degree ⩽ 3).

It is however advised to ensure that the circuit breakers are installed in correctly cooled switchboards without excessive dust.

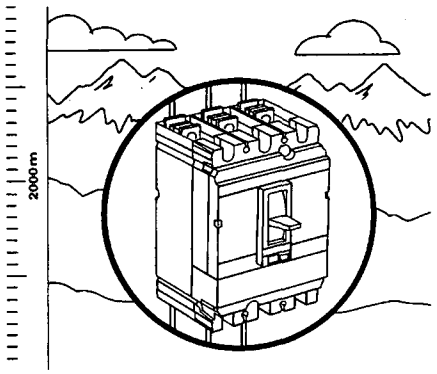
vibrations



Compact NS circuit breakers are guaranteed against mechanical or electromagnetic vibration levels as specified in the following standards:
- IEC68-2-6,
- Veritas NI122E,
- Lloyd's Register of Shipping,
- JIS 8370.

Excessive vibration may however provoke untimely tripping, loosening of connections or even rupture of parts.

altitude

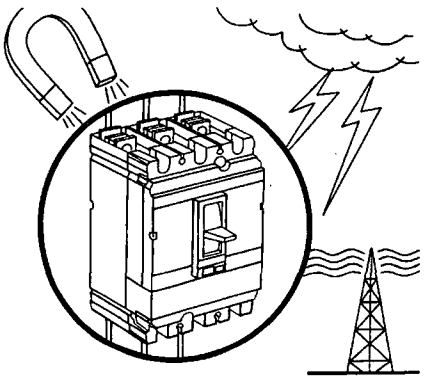


Compact NS circuit breakers are designed to operate within their rated characteristics at altitudes up to 2 000 metres.

Above 2 000 m, modifications in the ambient air characteristics (dielectric withstand capacity, cooling capacity) result in the following derating:

altitude (m)	≤ 2000	3000	4000
maximum operating voltage(V)	690	600	480
rated thermal current (A) at 40°C	In	0,96 x In	0,93 x In

electromagnetic disturbances



Compact NS circuit breakers equipped with an electronic trip unit and a Vigi module are protected against:
- overvoltages produced by electromagnetic switchgear,
- overvoltages produced by atmospheric disturbances and conducted by electrical networks (eg. lightning strikes),
- devices emitting radio waves (radio transmitters, walkie-talkies, radar, etc.),
- electrostatic discharges produced directly by operators.

They pass EMC (electromagnetic compatibility) tests in compliance with the following international standards:
- IEC 255-22-1 class 3:
  - 10 kV 1.2 / 50 µs overvoltage wave,
  - 2.5 kV1 MHz damped oscillatory wave,
- IEC 1000-4-2 class 4:
electrostatic discharges 15 kV,
- IEC 1000-4-3 class 3:
10 V/m radiated electromagnetec fields,
- IEC 1000-4-4 class 4:
4 kV fast transient waves,
- IEC 1000-4-5 class 4:
  - 4 kV 1.2 / 50 µs voltage waves,
  - 2 kA 8 / 20 µs current waves,
- EN 50081-1 class B:
conducted and radiated emissions in switchboards,
- IEC 947-2 annex F.

The above tests ensure:
- absence of nuisance tripping,
- overload tripping times.

commissioning and exploitation

prior to commissioning new circuit breakers or following an extended shutdown

A general check requires only a few minutes and eliminates any risks of incorrect operation due to error or neglect.

All checks must be carried out with the switchboard de-energised. For compartmented switchboards, it is sufficient that all accessible sections be de-energised.

	A	B	C	D	E	F	G
prior to commissioning	■	■	■	■	■	■	■
periodically during service life				■	■		■
following servicing on the switchboard		■	■	■	■		■
periodically during an extended shutdown		■		■		■	
following an extended shutdown	(1)	■	(2)	■	■	■	■

A electrical tests
B switchboard inspection
C conformity with diagram
D device mounting, connections-
E auxiliaries
F mechanical operation
G operation of the electronic trip units and the Vigi modules.

(1) extended shutdown or modifications in the switchboard
(2) modification in the switchboard

electrical tests

Insulation and dielectric withstand capacity tests are carried out prior to delivery of the switchboard. These tests are governed by applicable standards and must always be carried out by an authorised specialist.

switchboard inspection

Check that the circuit breakers are installed in a clean environment, free of dust and all installation debris (tools, wiring, chips, metal particles, etc.).

compliance with diagram

Check the conformity of devices with the installation diagram:
□ ratings and breaking capacities indicated on the rating plates,
□ trip unit identification (type, rating),
□ presence of additional functions (Vigi earth fault protection, motor mechanism, rotary handle, auxiliaries, indication and measurement modules),
□ protection settings (overload, short-circuit, earth fault),
□ outgoing circuit identification on the front of devices,
□ for Vigicompact earth fault protection circuit breakers, check that the intermediate terminal shield is installed, otherwise the earth fault protection function is inoperative.

device mounting-status of connections and auxiliaries

Check **device mounting** in the switchboard and the tightness of power connection.

Check that **auxiliaries and accessories are correctly installed**:
□ motor mechanism modules or rotary handles,
□ accessories (terminal shields, door escutcheons, etc.),
□ connection of auxiliary circuits.

mechanical operation

Check the **mechanical operation** of devices:
□ contact opening,
□ contact closing,
□ tripping using the "push to trip".

operation of the electronic trip units and the Vigi modules

Check the **electronic trip units** using the mini test kit or calibration test kit (see page 13).

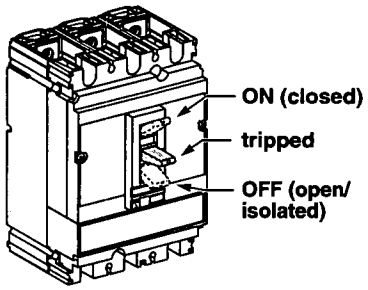
Check the **Vigi modules** using the test button on the front plate. This test guarantees tripping in the event of an earth fault.

following tripping

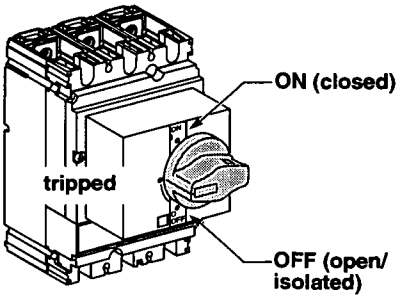
trip indication

Tripping is indicated on the front:

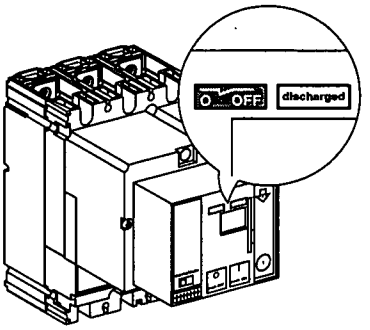
by the toggle



by the rotary handle



by the motor mechanism



identifying causes

A circuit breaker must NEVER be reset before identifying and eliminating the cause of the trip.

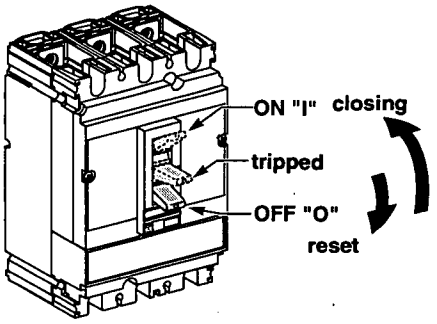
Causes may be multiple:

- depending on how the circuit breaker is fitted out, certain auxiliaries (SD, SDE, SDV, etc.) or LED indications on the trip unit are important means in identifying the cause of the trip (see table page 48),
- depending on the cause of the trip and prior to restarting the installation, certain precautions must be taken, namely insulation and dielectric tests on the installation, in part or in whole. These checks and tests must be carried out by qualified personnel.

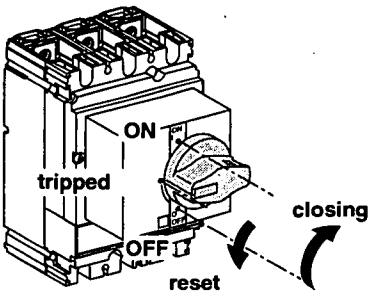
circuit breaker reset

When the lever is in the "tripped" position, the device must first be reset by setting the lever to the O/OFF position before reclosing (ON position).

toggle



rotary handle



motor mechanism

See page 5 for the applicable procedure.

operational anomalies

The table below does not list all possibilities, but can nonetheless assist in troubleshooting and providing corrective action.

If however, the problem persists, consult the Schneider Electric after-sales support department.

problems	indication	probable cause	corrective action
repeated tripping			
	SD SDE "alarm" on electronic trip units	■ protection settings are incorrect.	check the rated current of the supply network and set the proper value. check the setting for overload protection.
	SD	■ supply voltage for the undervoltage release (MN) is too low or subject to major fluctuations.	check the value of the power supply voltage and correct it. (DC networks are subject to major voltage fluctuations when loads are turned on. Voltage drops may provoke tripping on the circuit breaker by the MN release.
	SD	■ inadvertent powering of MX shunt release.	determine the causes of the powering.
	SD SDE	■ ambient temperature too high.	ventilate the room or the device.
	SD SDE SDV	■ Vigi module settings are incorrect.	
		■ insulation fault.	check the insulation of the protected circuit.
circuit breaker does not close			
manual operation	SD SDE	■ supply network is faulty.	identify and eliminate the fault.
	SD	■ MX shunt release is supplied with power.	determne the causes of the supply of power.
		■ MN undervoltage relese is not supplied with power.	check for power across the terminals and that connections are correct.
	OF	■ circuit breaker is interlocked.	check the installation diagram and the interlocking system (electrical or mechanical) of the two circuit breakers.
motor mechanism	OF	■ closing order inoperative.	■ check that the selector on the front is in the automatic position. ■ check the power supply for the motor mechanism module, the motor and the closing signals.
	SDE SD	■ the device tripped due on an electrical fault.	■ identify and eliminate the fault. ■ manually charge the motor mechanism module spring.

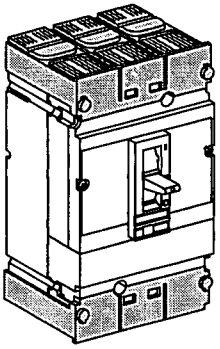
practical advice

maintaining performance levels of circuit breakers

Due to their design and characteristics, **Compact NS circuit breakers require no maintenance.**
It is nonetheless recommended to ensure that devices operate in the conditions specified in the catalogue, namely:

- electrical and mechanical conditions,
- environmental conditions (see pages 46 and 47).

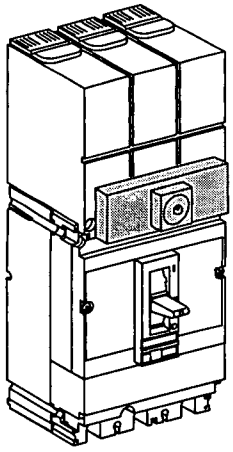
improved safety



The following options are available:
- **long or short terminal shields** providing IP 40 protection,
- a sealable **plate to block access to settings** (thermal-magnetic trip units),
- **flexible phase barriers** to improve insulation between power connections,
- toggle cover to ensure IP 43 protection.

The base (plug-in configuration) can be fitted with:
- **shutters** to block access to power parts (IP 4x protection).

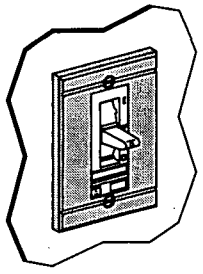
improved comfort



- a full range of **electrical indication auxiliaries** (OF, SD, SDE, SDV),
- **indication of voltage presence** across device terminals,
- **current measurement** module with an incorporated ammeter or remote indication of the measured value,
- **load-circuit identification means** (see Telemecanique catalogue, catalogue number AB1),
- **alarm indications** (standard on devices equipped with electronic trip units).

- **indication options** on trip unit STR53UE (see page 23),
- **Digipact** indication, measurement and control modules.

improved aesthetics



- a range of **escutcheons** providing different protection (IP) levels for fixed devices, plug-in and withdrawable configutations, motor mechanism modules and rotary handles.

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http://www.schneiderelectric.com

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

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ART 73432

07-99

SJ ELECTRIC

TECHNICAL DATA SHEET

For

Cockle Street Pump Station

Equipment Type:	Circuit Breaker
Location:	Switchboard Distribution Chassis
Model Numbers:	Multi 9
Manufacturer:	Merlin Gerin
Supplier:	Schneider Electric. 30 Graystone Street TINGALPA QLD 4173 Ph: 07 3890 2112 Fx: 07 3890 2098

C60N circuit-breakers
B and C curves
IEC 898: 6000 A, IEC 947-2: 10 kA

functions

The circuit-breakers combine the following functions:
- protection of circuits against short-circuit currents,
- protection of circuits against overload currents,
- control,
- isolation,
- protection of persons against indirect contact in TN and IT earthing systems.

C60N circuit-breakers are used in the tertiary sector and industry.

description

technical data common to C60N circuit-breakers

b power circuit
v voltage rating: 440 V CA
v breaking capacity according to IEC 947-2, Icu ultimate breaking capacity (O-CO cycle) :

rating (A)	type	voltage (V)	breaking capacity Icu (kA)
0.5...63	1P	230...240	10
		400...415	3 (1)
	1P + N, 2P, 3P, 4P	230...240	20
	2P, 3P, 4P	400...415	10

(1) breaking capacity under 1 pole in an IT insulated earthing system (case of the double fault).

v limitation class (IEC 898): 3
v number of cycles (O-C): 20 000
b environment
v tropicalisation: treatment 2 (relative humidity: 95 % at 55 °C)
v connection: tunnel terminals for the following cables:
- 16 mm² flexible or 25 mm² rigid up to rating 25 A
- 25 mm² flexible or 35 mm² rigid for 32 to 63 A ratings.

B curve

use

when there are weak short-circuit currents (generators, long cables).

technical data

b power circuit:
v ratings: 6 to 63 A set at 30 °C
v tripping curve: the magnetic trip units operate between 3 and 5 In
v breaking capacity according to IEC 898, Icn ultimate breaking capacity (O-CO cycle) :

rating (A)	type	voltage (V)	breaking capacity Icn (A)
10...63	1P	230...400	6 000
	1P + N	230	6 000
	2P, 3P, 4P	400	6 000

v limitation class (IEC 898): 3

C curve

use

cables feeding conventional loads.

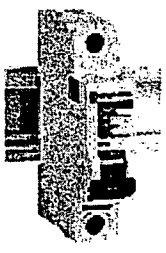
technical data

b power circuit
v ratings: 0.5 to 63 A set at 30 °C
v tripping curve: the magnetic trip units operate between 5 and 10 In
v breaking capacity according to IEC 898, Icn ultimate breaking capacity (O-CO cycle):

rating (A)	type	voltage (V)	breaking capacity Icn (A)
0.5...63	1P	230...400	6 000
	1P + N	230	6 000
	2P, 3P, 4P	400	6 000

v limitation class (IEC 898): 3

catalogue numbers



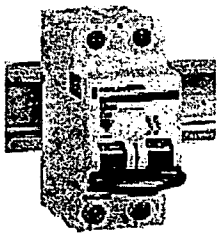
24057

C60N B curve

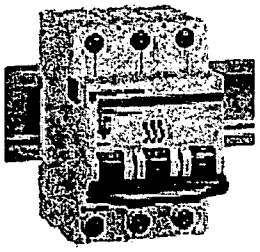
type	rating (A)	catalogue number	width in modules of 9 mm	quantity per pack
1P	6	24049	2	12
	10	24050	2	12
	16	24051	2	12
	20	24052	2	12
	25	24053	2	12
	32	24054	2	12
	40	24055	2	12
	50	24056	2	12
	63	24057	2	12

C60N circuit-breakers
B and C curves
IEC 898: 6000 A, IEC 947-2: 10 kA

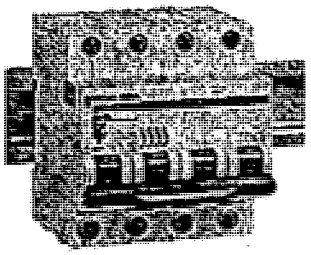
catalogue numbers



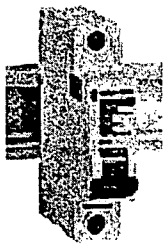
24083



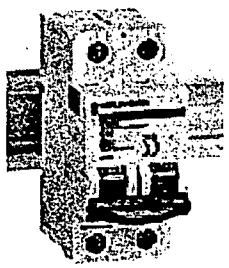
24094



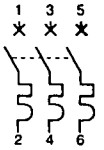
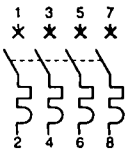
24107



24248

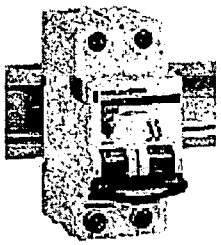


24262

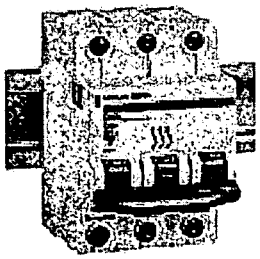
type		rating (A)	catalogue number	width in mod. of 9 mm	quantity per batch
C60N B curve (continued)					
2P		6	24075	4	6
		10	24076	4	6
		16	24077	4	6
		20	24078	4	6
		25	24079	4	6
		32	24080	4	6
		40	24081	4	6
		50	24082	4	6
		63	24083	4	6
3P		6	24088	6	4
		10	24089	6	4
		16	24090	6	4
		20	24091	6	4
		25	24092	6	4
		32	24093	6	4
		40	24094	6	4
		50	24095	6	4
		63	24096	6	4
4P		6	24101	8	3
		10	24102	8	3
		16	24103	8	3
		20	24104	8	3
		25	24105	8	3
		32	24106	8	3
		40	24107	8	3
		50	24108	8	3
		63	24109	8	3
C60N C curve					
1P		0,5	24067	2	12
		1	24235	2	12
		2	24236	2	12
		3	24237	2	12
		4	24238	2	12
		6	24239	2	12
		10	24240	2	12
		16	24242	2	12
		20	24243	2	12
		25	24244	2	12
		32	24245	2	12
		40	24246	2	12
		50	24247	2	12
		63	24248	2	12
1P + N		1	24249	4	6
		2	24250	4	6
		3	24251	4	6
		4	24252	4	6
		6	24253	4	6
		10	24254	4	6
		16	24256	4	6
		20	24257	4	6
		25	24258	4	6
		32	24259	4	6
		40	24260	4	6
		50	24261	4	6
		63	24262	4	6

C60N circuit-breakers
B and C curves
IEC 898: 6000 A, IEC 947-2: 10 kA

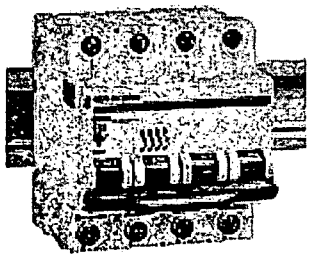
catalogue numbers



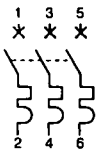
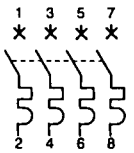
24272



24285



24304

type	rating (A)	catalogue number	width in mod. of 9 mm	quantity per batch
C60N C curve (continued)				
2P 	0.5	24068	4	6
	1	24263	4	6
	2	24264	4	6
	3	24265	4	6
	4	24266	4	6
	6	24267	4	6
	10	24268	4	6
	16	24270	4	6
	20	24271	4	6
	25	24272	4	6
	32	24273	4	6
	40	24274	4	6
	50	24275	4	6
	63	24276	4	6
3P 	0.5	24069	6	4
	1	24277	6	4
	2	24278	6	4
	3	24279	6	4
	4	24280	6	4
	6	24281	6	4
	10	24282	6	4
	16	24284	6	4
	20	24285	6	4
	25	24286	6	4
	32	24287	6	4
	40	24288	6	4
	50	24289	6	4
	63	24290	6	4
4P 	0.5	24070	8	3
	1	24291	8	3
	2	24292	8	3
	3	24293	8	3
	4	24294	8	3
	6	24295	8	3
	10	24296	8	3
	16	24298	8	3
	20	24299	8	3
	25	24300	8	3
	32	24301	8	3
	40	24302	8	3
	50	24303	8	3
	63	24304	8	3

additional information

SJ ELECTRIC

TECHNICAL DATA SHEET

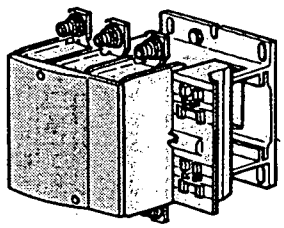
For

Cockle Street Pump Station

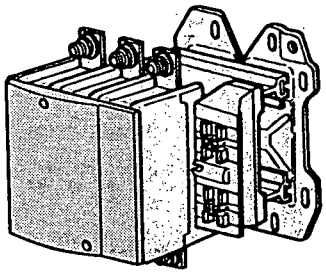
Equipment Type:	Contactors
Location:	Pump Cubicles
Model Numbers:	LC1-F
Manufacturer:	TELEMECANIQUE
Supplier:	Schneider Electric. 30 Graystone Street TINGALPA QLD 4173 Ph: 07 3890 2112 Fx: 07 3890 2098

LC1 F115 ... F630, F800

Contacteurs
CONTACTORS
SCHUTZE
CONTATTORI
CONTACTORES

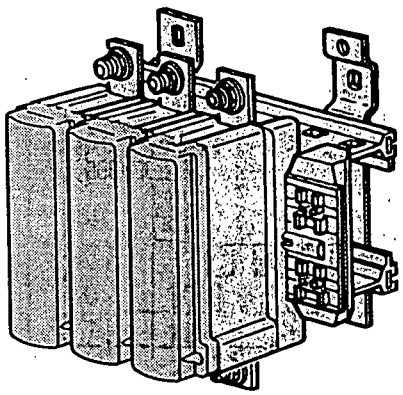


LC1-F115
LC1-F150
LC1-F185
LC1-F225
LC1-F265
LC1-F330



LC1-F400
LC1-F500

LC1-F630
LC1-F800



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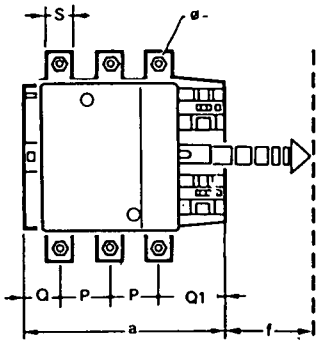
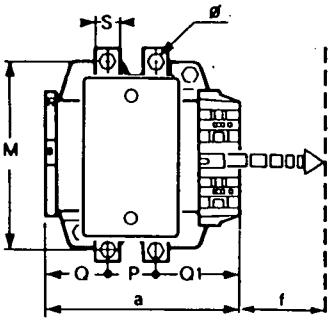
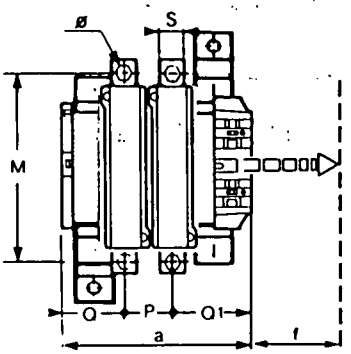
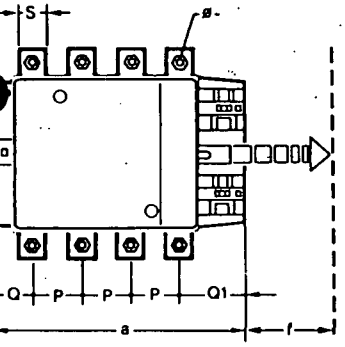
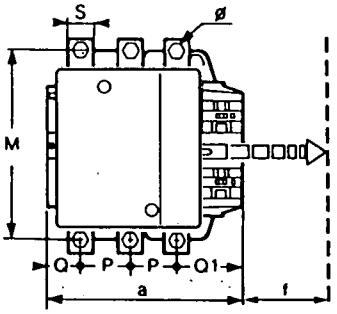
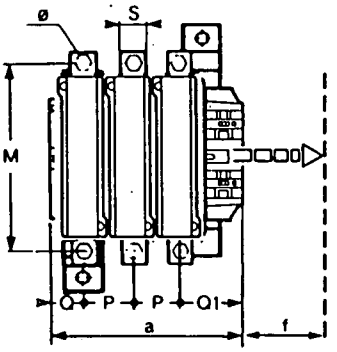
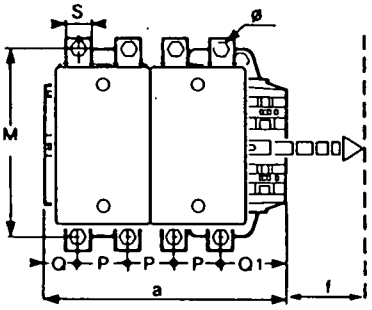
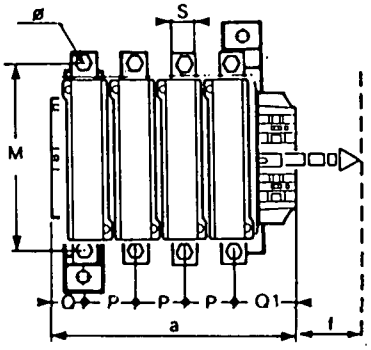
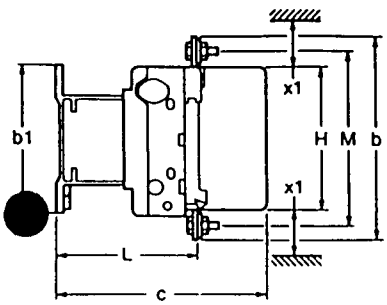
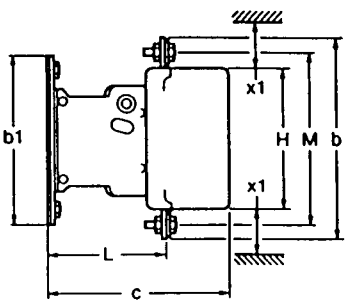
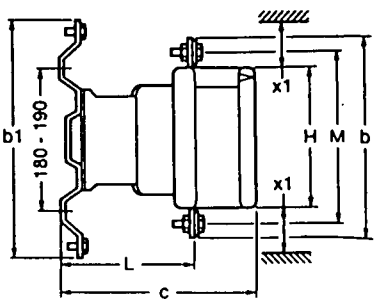
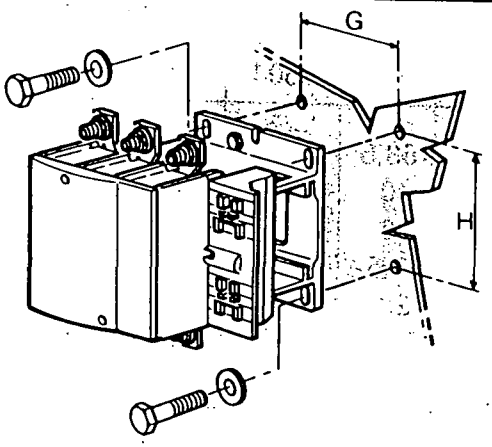
Telemecanique SQUARE D

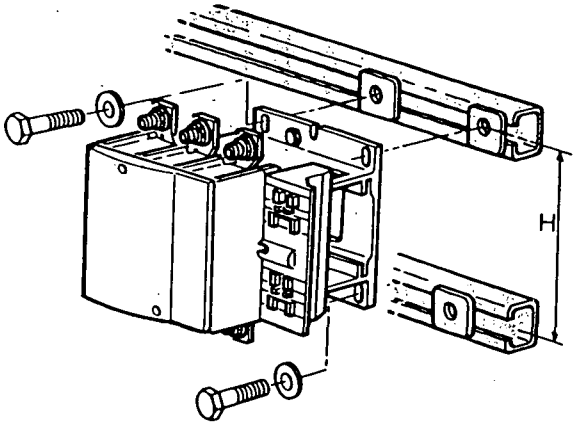
LC1-F115 ... 330	LC1-F400 ... 500	LC1-F630, F800
		
		
		
		

	LC1-F115		LC1-F150		LC1-F185		LC1-F225		LC1-F265	
mm	115	1154	150	1504	185	1854	225	2254	265	2654
a	163,5	200,5	163,5	200,5	168,5	208,5	168,5	208,5	201,5	244,5
P	37	37	40	40	40	40	48	48	48	48
Q	29,5	29,5	26	25	29	29	21	17	39	34
Q1	60	60	57,5	55,5	59,5	59,5	51,5	47,5	66,5	66,5
S	20	20	20	20	20	20	25	25	25	25
Ø	M6	M6	M8	M8	M8	M8	M10	M10	M10	M10
f	131	131	131	131	130	130	130	130	147	147
b	162	162	170	170	174	174	197	197	203	203
b1	137	137	137	137	137	137	137	137	145	145
M	147	147	150	150	154	154	172	172	178	178
H	124	124	124	124	127	127	127	127	147	147
c	171	171	171	171	181	181	181	181	213	213
L	107	107	107	107	113,5	113,5	113,5	113,5	141	141
X1										
220...500V	10		10		10		10		10	
660...1000V	15		15		15		15		15	

inches = mm x 0.0394

	LC1-F330		LC1-F400			LC1-F500			LC1-F630 / LC1-F800		
mm	330	3304	4002	400	4004	5002	500	5004	6302	630 800	6304
a	213	261	213	213	261	233	233	288	309	309	389
P	48	48	48	48	48	55	55	55	80	80	80
Q	43	43	69	43	43	76	46	46	102	60	60
Q1	74	74	96	74	74	102	77	77	127	89	89
S	25	25	25	25	25	30	30	30	40	40	40
Ø	M10	M10	M10	M10	M10	M10	M10	M10	M12	M12	M12
f	147	147	146	146	146	150	150	150	181	181	181
b	206	206	206	206	206	238	238	238	304	304	304
b1	145	145	209	209	209	209	209	209	280	280	280
M	181	181	181	181	181	208	208	208	264	264	264
H	158	158	158	158	158	172	172	172	202	202	202
c	219	219	219	219	219	232	232	232	255	255	255
L	145	145	145	145	145	146	146	146	155	155	155
X1											
220...500V	10		15			15			20		
660...1000V	15		20			20			30		

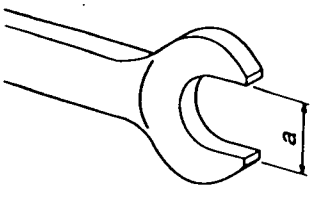


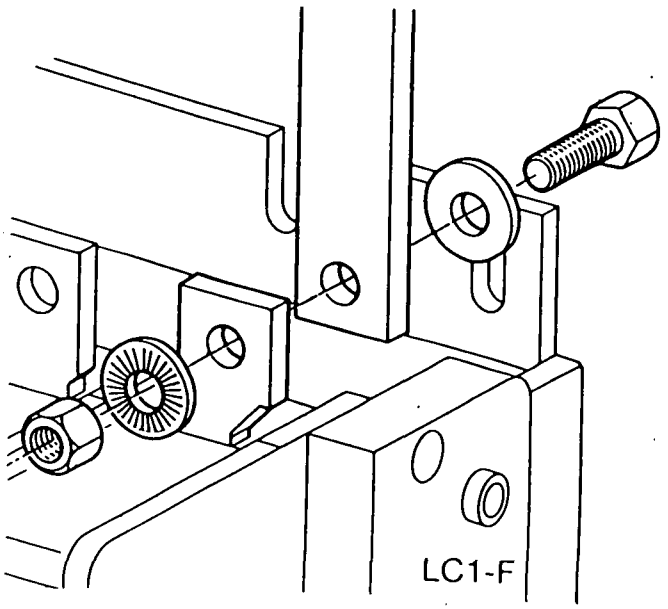


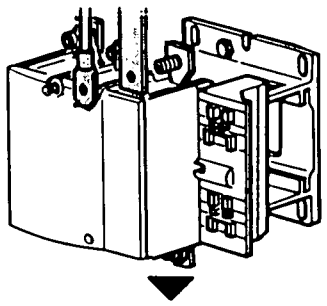
inches = mm x 0.0394

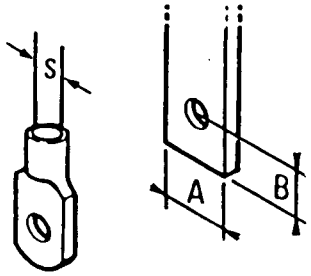
LC1-F		115/1154 150/1504 185/1854 225/2254	265/2654 330/3304	400/4002 4004 500/5002	5004	630/6302	6304	800
(mm)	G	80	96	80	140	180	240	180
	H	110 - 120		170 - 180		180 - 190		

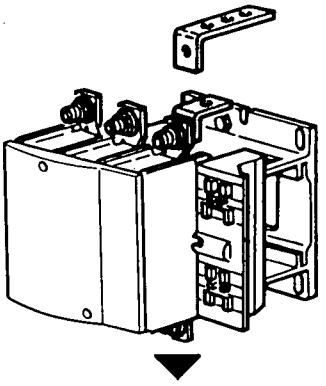
LC1-F	a (mm)
115/1154	10
150/1504/185/1854	13
225 ... 5004	16
630/6304/800	18



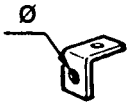




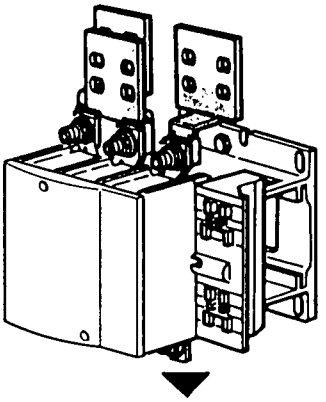


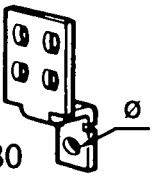


LA9-F•979

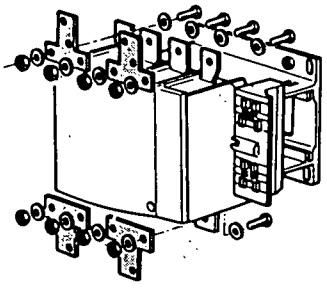


LA9-F•981

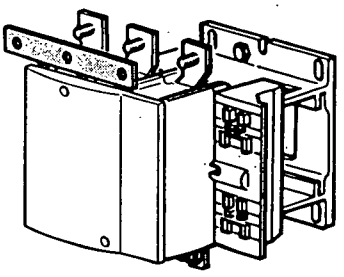




LA9-F•980



LA9-F•602

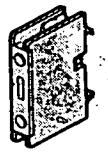


LA9-F•601

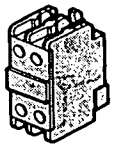
C : N.m

	115	150	185	225	265	330	400	500	630	800
A (mm)	⩽ 20	⩽ 25	⩽ 25	⩽ 30	⩽ 30	⩽ 30	⩽ 30	⩽ 40	⩽ 60	⩽ 60
B (mm)	10	12,5	12,5	15	15	15	15	20	25	25
ø (mm)	6,6	9	9	11	11	11	11	11	13	13
S (mm^2)	95	120	150	185	240	240	2x150	2x240	-	-
c (Nm)	10	18	18	35	35	35	35	35	58	58

LC1-F ▼	3 x	3 x	3 x	4 x	1 x
115	LA9-FF981	LA9-FF979	LA9-FF980	LA9-FF602	LA9-FF601
150	LA9-FG981	LA9-FG979	LA9-FG980	LA9-FG602	LA9-FG601
185	LA9-FG981	LA9-FG979	LA9-FG980	LA9-FG602	LA9-FG601
225	LA9-FJ981	LA9-FJ979	LA9-FJ980	LA9-FJ602	LA9-FH601
265	LA9-FJ981	LA9-FJ979	LA9-FJ980	LA9-FH602	LA9-FH601
330	LA9-FJ981	LA9-FJ979	LA9-FJ980	LA9-FH602	LA9-FH601
400	LA9-FJ981	LA9-FJ979	LA9-FJ980	LA9-FH602	LA9-FH601
500	LA9-FK981	LA9-FK979	LA9-FK980	LA9-FK602	LA9-FK601
630	LA9-FL981	LA9-FL979	LA9-FL980	LA9-FL602	LA9-FL601
800	LA9-FL981	LA9-FL979	LA9-FL980		LA9-FL601

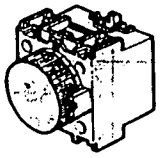


LA1-DN $^{10}_{01}$



$^{11}_{20}$
LA1-DN $^{20}_{02}$

DN
DC
LA1-DX (1)
DZ (1)
DY (1)

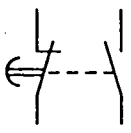


LA2-DS
LA2-DT
LA3-DR

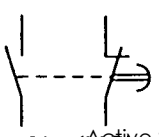
1 "F" (NO)	LA1-DN10
1"O" (NC)	LA1-DN01
1 "F" + 1 "O" (NO) (NC)	LA1-DN11
2 "F" (NO)	LA1-DN20
2 "O" (NC)	LA1-DN02
2 "F" + 2 "O" (NO) (NC)	LA1-DN22
1 "F" + 3 "O" (NO) (NC)	LA1-DN13
4 "F" (NO)	LA1-DN40
4 "O" (NC)	LA1-DN04
3 "F" + 1 "O" (NO) (NC)	LA1-DN31
2 "F" + 2 "O" (NO) (NC)	LA1-DC22
2 "F" (NO)	LA1-DX20 (1)
2 "F" + 2 "F" (NO) (NO)	LA1-DZ40 (1)
1 "F" + 1 "O" + 2 "F" (NO) (NC) (NO)	LA1-DZ31 (1)
2 "F" (NO)	LA1-DY20 (1)

(1) LA1-DX/DY/DZ

Environnement polluant
DUST-TIGHT CONTACTS
FUR VERSCHMUTZTE UMGEBUNG
AMBIENTI POLVEROSI
AMBLENTE POLVORIENTO

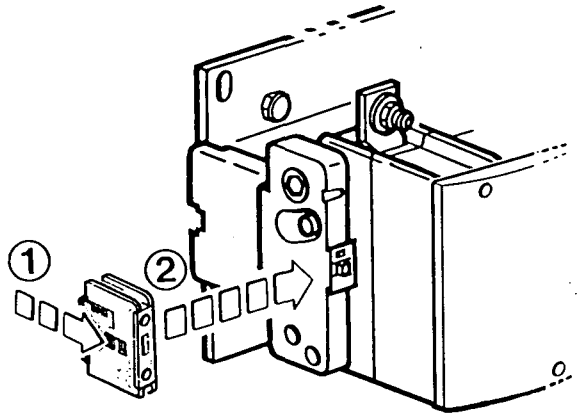


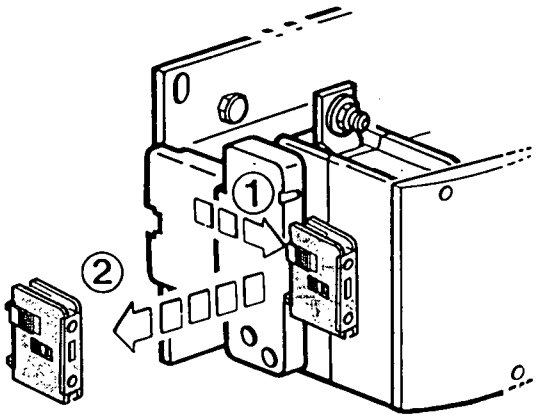
0,1 ... 3 s	LA2-DT0
0,1 ... 30 s	LA2-DT2
1 ... 30 s	LA2-DS2
10 ... 180 s	LA2-DT4

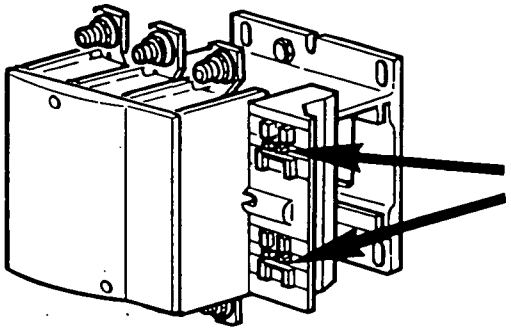


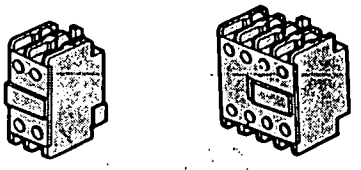
0,1 ... 3 s	LA3-DR0
0,1 ... 30 s	LA3-DR2
10 ... 180 s	LA3-DR4

LA1-DN 10
01



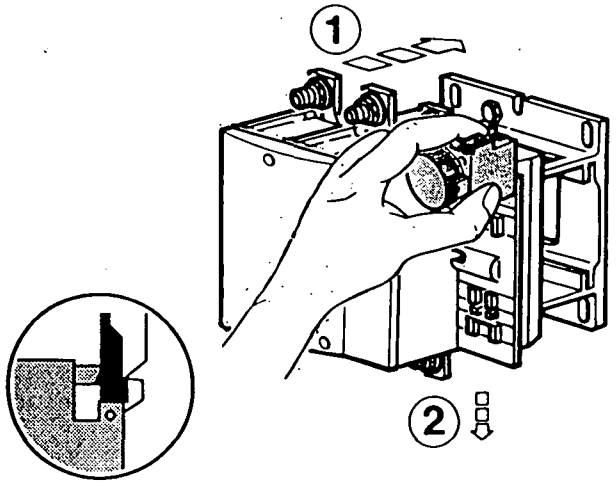


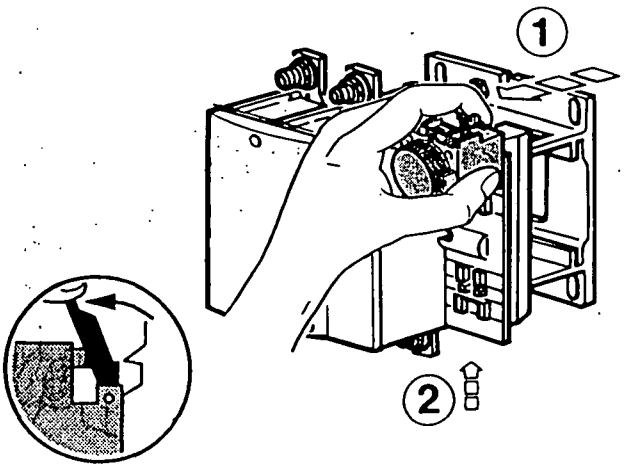


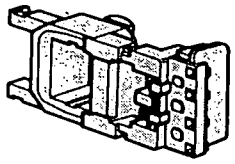


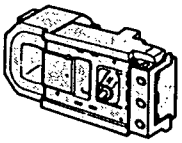
LA1-D•

LA2-D•
LA3-D•





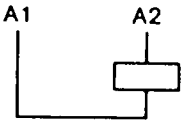




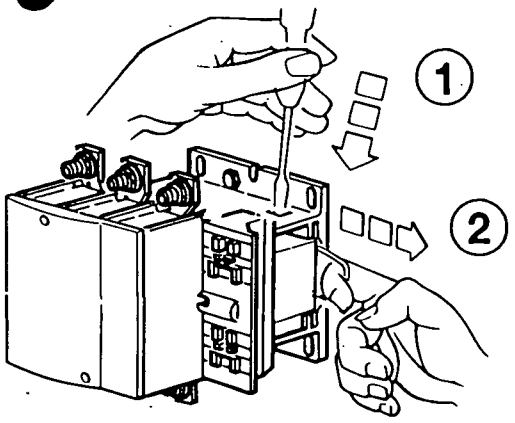
(LC1-F115 ... 225) (LC1-F265 ... 630, 800)

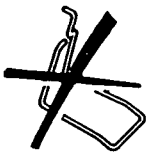
LX1-F•••• ~

LX9-F•••• ~
LX8-F8••• ~ / ⎓
LX4-F•••• ⎓

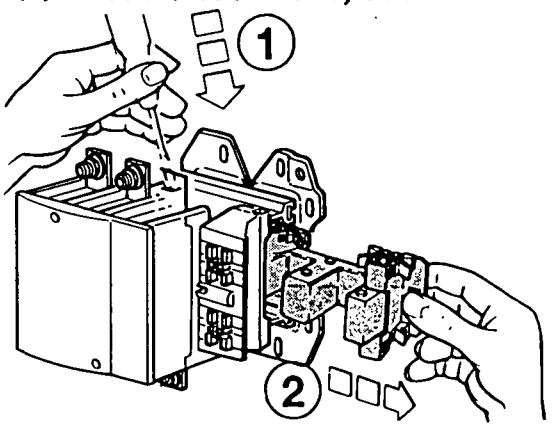


(1) LC1-F115 ... 330

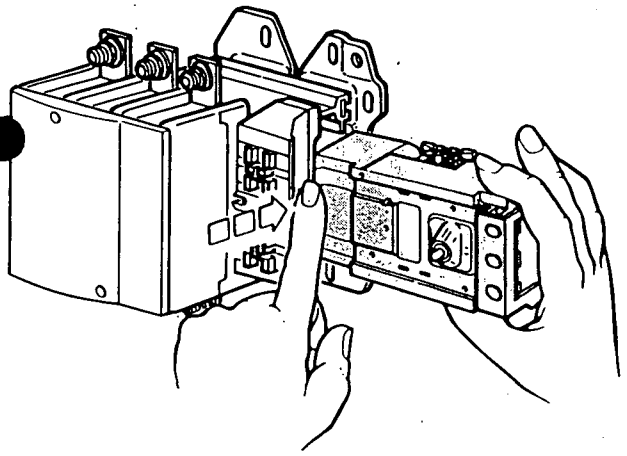




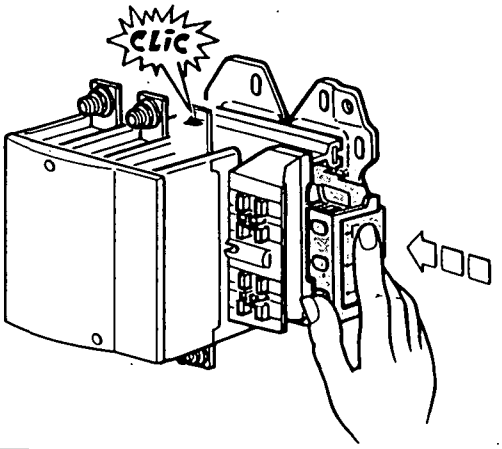
(1) LC1-F400 ...630, 800



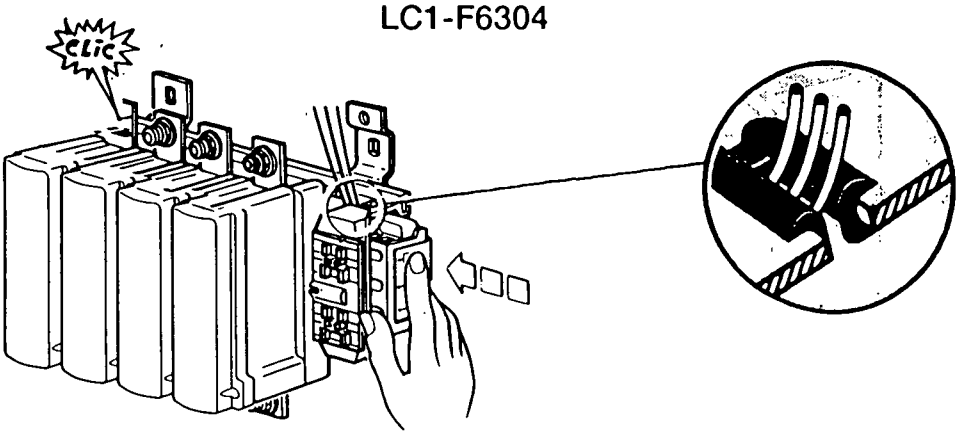
(2)

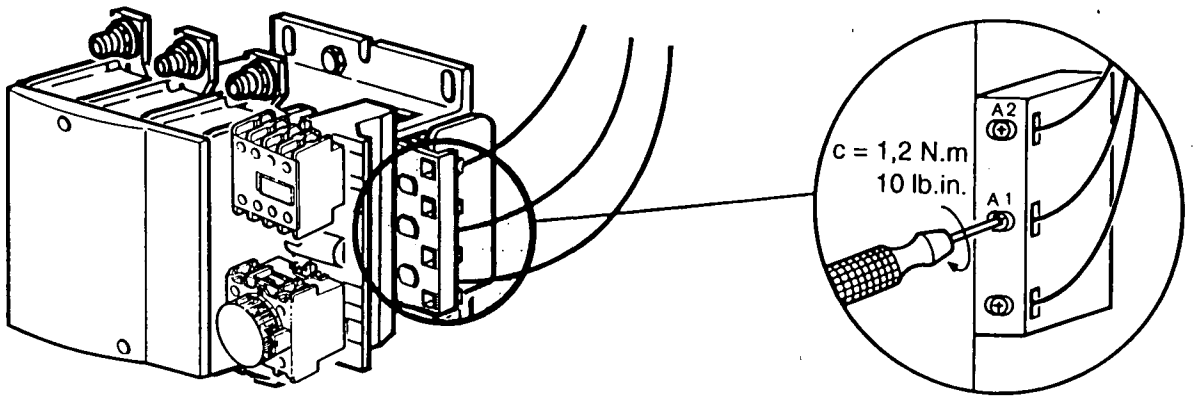


(3)

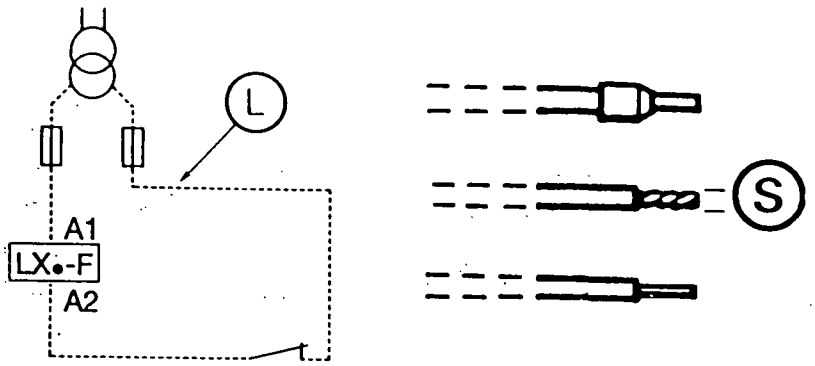


LC1-F6304



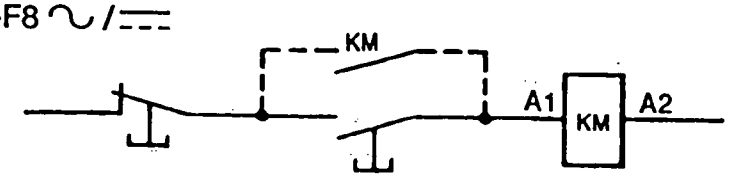


c = 1,2 N.m



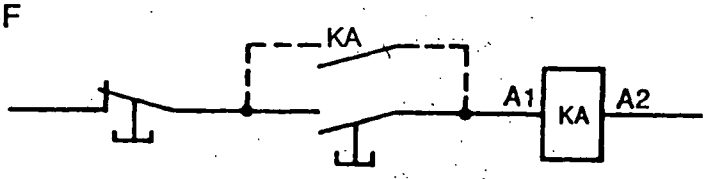
LX1-F ∿

LX8-F8 ∿ / ⎓

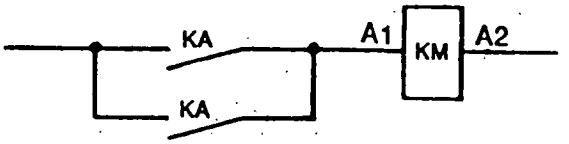


LX1-F / LX9-F ∿

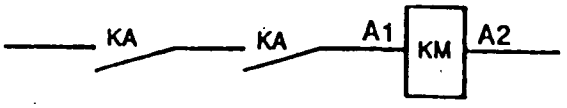
LX4 -F ⎓



48V
110V
125V

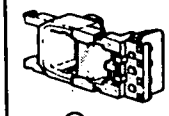


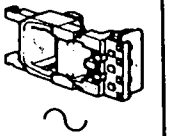
220V
250V
440V



LC1-F115 ... 330		
LX• -F ∿ / ⎓	L ⩽ ••• m	S ⩾ •• mm²
24V	4 7	2,5 4
48V	10 20 30	1,5 2,5 4
110V	40 60 100 150	1 1,5 2,5 4
220V	150 250 400 600	1 1,5 2,5 4
380V 440V	500 750 1200	1 1,5 2,5

LC1-F400 ... 630, 800		
LX• -F ∿ / ⎓	L ⩽ ••• m	S ⩾ •• mm²
48V	4 6 10	1,5 2,5 4
110V	15 20 40 60	1 1,5 2,5 4
220V	60 90 150 250	1 1,5 2,5 4
380V 440V	180 270 500	1 1,5 2,5

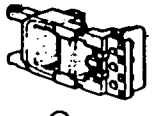
 50 Hz	VA *	VA *	Un	gG
LC1-F115/F150				
LX1-FF024	550	45	24V	12A
LX1-FF042	"	"	42V	8A
LX1-FF048	"	"	48V	6A
LX1-FF110	"	"	110V/115V	4A
LX1-FF127	"	"	127V	4A
LX1-FF220	"	"	220/230V	2A
LX1-FF240	"	"	240V	2A
LX1-FF380	"	"	380/400V	1A
LX1-FF415	"	"	415/440V	1A
LX1-FF500	"	"	500V	1A
LX1-FF660	"	"	660V	1A

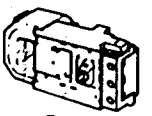
 60 Hz	VA *	VA *	Un	gG
LC1-F115/F150				
LX1-FF040	660	55	48V	6A
LX1-FF092	"	"	110V	4A
LX1-FF095	"	"	115/120V	4A
LX1-FF162	"	"	200/208V	2A
LX1-FF184	"	"	220V	2A
LX1-FF187	"	"	230/240V	2A
LX1-FF340	"	"	415V	2A
LX1-FF360	"	"	440V	1A
LX1-FF380	"	"	460/480V	1A
LX1-FF550	"	"	660V	1A

LC1-F185/F225				
LX1-FG024	805	55	24V	16A
LX1-FG042	"	"	42V	8A
LX1-FG048	"	"	48V	8A
LX1-FG110	"	"	110V/115V	4A
LX1-FG127	"	"	127V	4A
LX1-FG220	"	"	220/230V	2A
LX1-FG240	"	"	240V	2A
LX1-FG380	"	"	380/400V	1A
LX1-FG415	"	"	415/440V	1A
LX1-FG500	"	"	500V	1A
LX1-FG660	"	"	660V	1A

LC1-F185/F225				
LX1-FG040	970	66	48V	10A
LX1-FG092	"	"	110V	6A
LX1-FG095	"	"	115/120V	6A
LX1-FG162	"	"	200/208V	4A
LX1-FG184	"	"	220V	4A
LX1-FG187	"	"	230/240V	4A
LX1-FG340	"	"	415V	2A
LX1-FG360	"	"	440V	2A
LX1-FG380	"	"	460/480V	2A
LX1-FG550	"	"	660V	1A

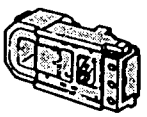
* θ = 20°C

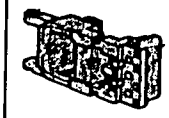
 40...400 Hz	VA *	VA *	U_n	gG
LC1-F265/F330				
LX1-FH0482	600 • • 700	8 • • 10	48V	10A
LX1-FH1102			110V/115V	6A
LX1-FH1272			120/127V	6A
LX1-FH2202			220/230V	4A
LX1-FH2402			240V	4A
LX1-FH3802			380/415V	2A
LX1-FH5002			480/500V	2A
LC1-F400				
LX1-FJ048	1000 • • 1150	12 • • 18	48V	10A
LX1-FJ110			110/120V	6A
LX1-FJ127			127V	6A
LX1-FJ220			220/230V	4A
LX1-FJ240			240V	4A
LX1-FJ380			380/400V	2A
LX1-FJ415			415/480V	2A
LX1-FJ500			500V	2A

 40...400 Hz	VA *	VA *	U_n	gG
LC1-F500				
LX1-FK048	1050 • • 1150	16 • • 20	48V	10A
LX1-FK110			110/120V	6A
LX1-FK127			127V	6A
LX1-FK220			220/230V	4A
LX1-FK240			240V	4A
LX1-FK380			380/400V	2A
LX1-FK415			415/480V	2A
LX1-FK500			500V	2A
LC1-F630				
LX1-FL048	1500 • • 1730	20 • • 25	48V	16A
LX1-FL110			110/120V	8A
LX1-FL127			127V	8A
LX1-FL220			220/240V	6A
LX1-FL380			380/400V	4A
LX1-FL415			415/480V	2A
LX1-FL500			500V	2A

* 50/60 Hz , θ = 20°C

	W	W	U_n	gG
LC1-F115/150				
LX4-FF024	543 • • • 665	3,94 • • • 4,83	24V	12A
LX4-FF048			48V	6A
LX4-FF110			110V	4A
LX4-FF125			125V	4A
LX4-FF220			220/230V	2A
LX4-FF440			440/460V	1A
LC1-F185/225				
LX4-FG024	737 • • • 902	4,13 • • • 5,07	24V	16A
LX4-FG048			48V	8A
LX4-FG110			110V	4A
LX4-FG125			125V	4A
LX4-FG220			220/230V	2A
LX4-FG440			440/460V	1A
LC1-F265/330				
LX4-FH024	655 • • • 803	3,68 • • • 4,53	24V	16A
LX4-FH048			48V	8A
LX4-FH110			110V	4A
LX4-FH125			125V	4A
LX4-FH220			220/230V	2A
LX4-FH440			440/460V	1A

	W	W	U_n	gG
LC1-F400				
LX4-FJ048	920 • • • 1140	4 • • • 7,5	48V	10A
LX4-FJ110			110V	6A
LX4-FJ125			125V	6A
LX4-FJ220			220V	4A
LX4-FJ250			250V	4A
LX4-FJ440			440V	2A
LC1-F500				
LX4-FK048	990 • • • 1220	4,5 • • • 8	48V	10A
LX4-FK110			110V	6A
LX4-FK125			125V	6A
LX4-FK220			220V	4A
LX4-FK250			250V	4A
LX4-FK440			440V	2A
LC1-F630				
LX4-FL048	1420 • • • 1920	6,5 • • • 12,5	48V	16A
LX4-FL110			110V	8A
LX4-FL125			125V	8A
LX4-FL220			220V	4A
LX4-FL250			250V	4A
LX4-FL440			440V	2A

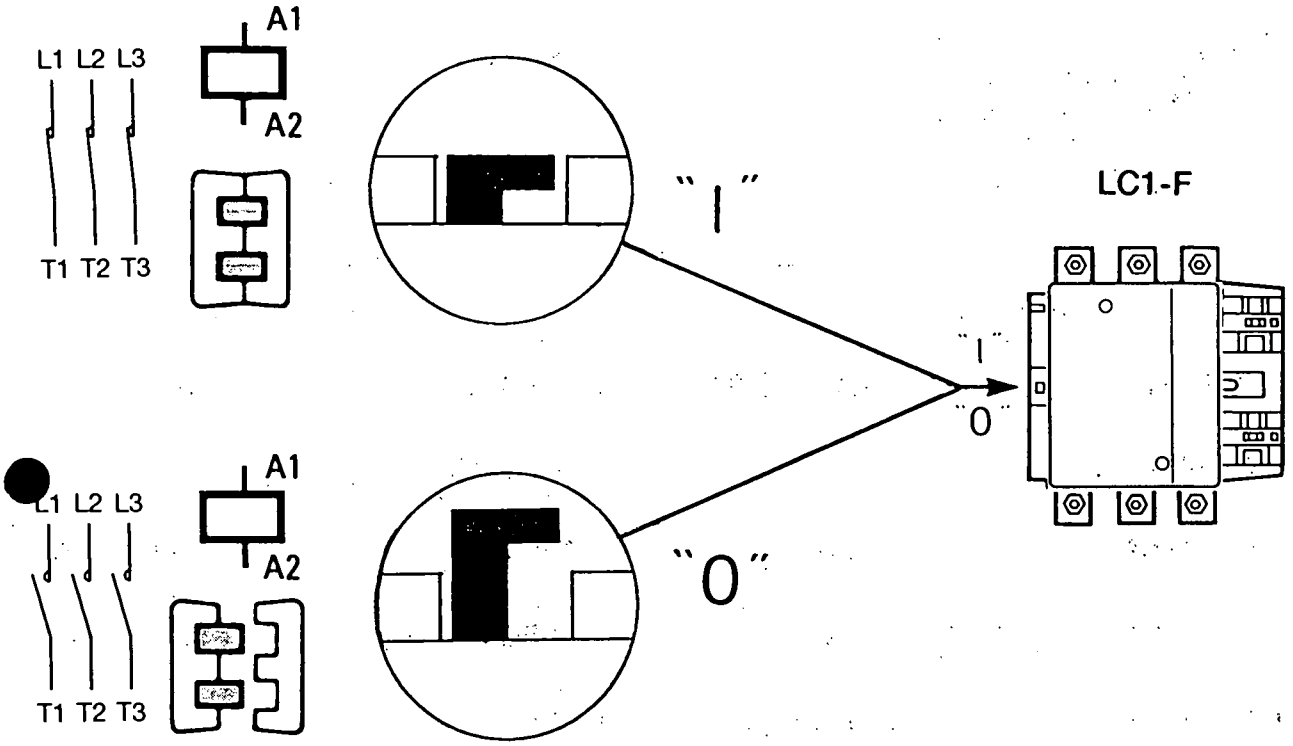


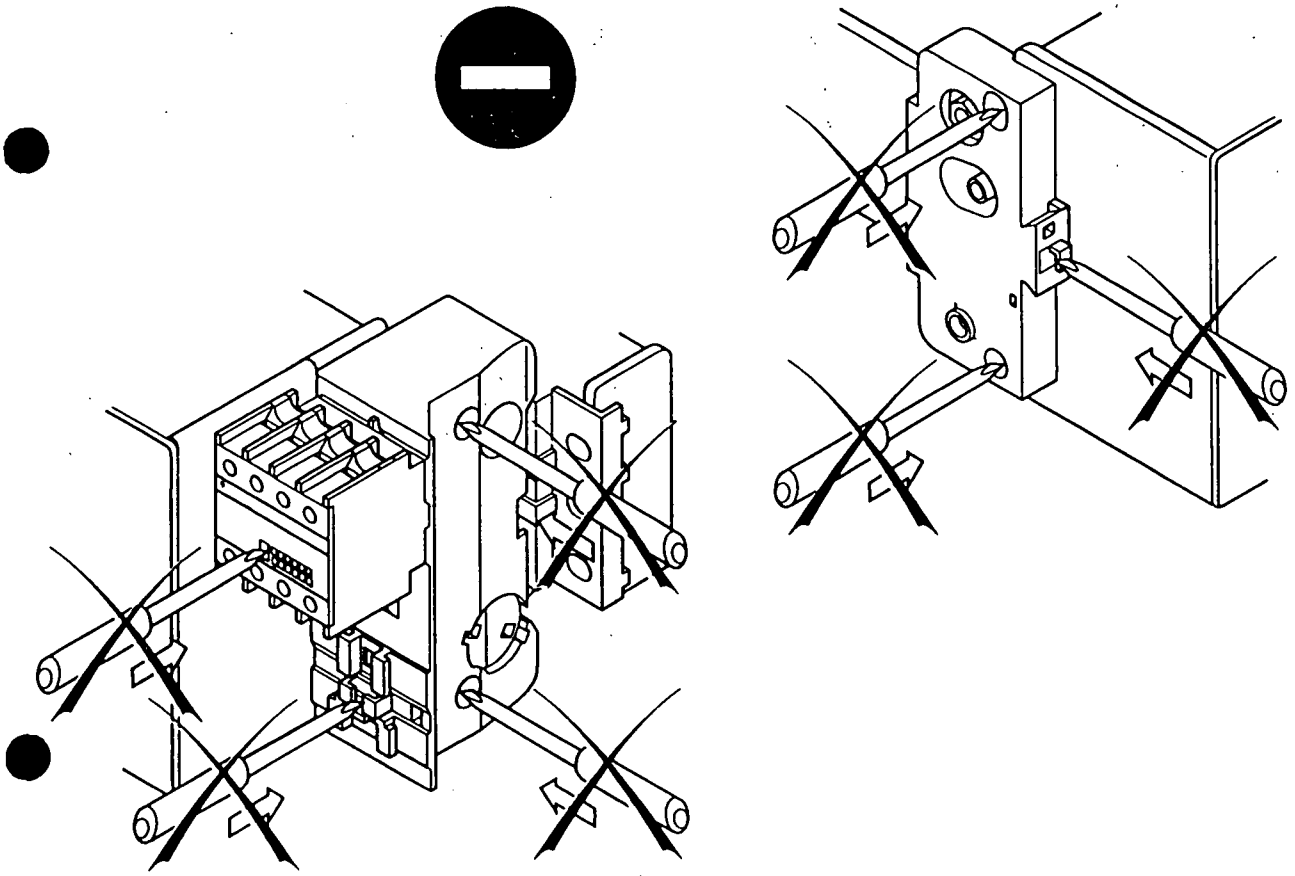
~ 40...400Hz	VA*	VA*	U_n	gG
LC1-F115/F150				
LX9-FF042			42V	10A
LX9-FF048			48V	8A
LX9-FF110			110/115V	4A
LX9-FF127	690	6,6	127V	4A
LX9-FF220	•	•	220/230V	2A
LX9-FF240	855	8,1	240V	2A
LX9-FF380			380/400V	2A
LX9-FF415			415/440V	1A
LX9-FF500			500V	1A

~ 40...400Hz	VA*	VA*	U_n	gG
LC1-F185/F225				
LX9-FG042			42V	16A
LX9-FG048			48V	10A
LX9-FG110			110/115V	6A
LX9-FG127	950	8,9	127V	6A
LX9-FG220	•	•	220/230V	4A
LX9-FG240	1180	10,9	240V	4A
LX9-FG380			380/400V	2A
LX9-FG415			415/440V	2A
LX9-FG500			500V	2A

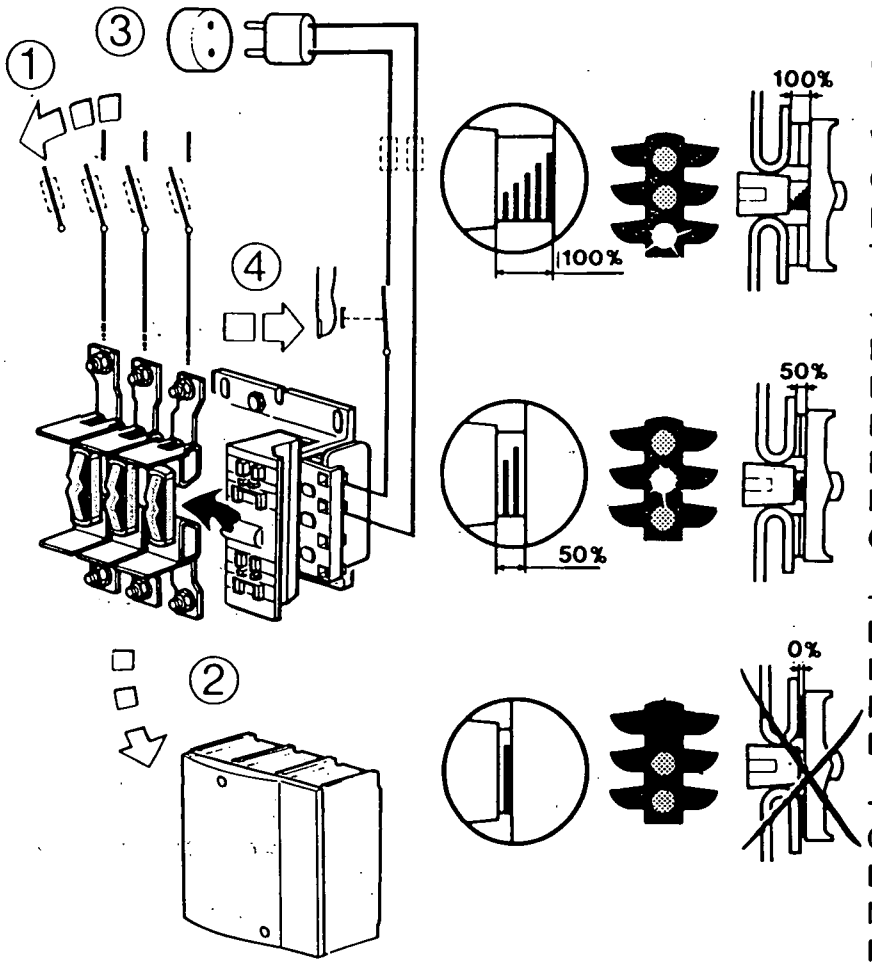
~ / ⎓	W	W	U_n	gG
LC1-F800				
LX8-F8FW			110/127V	8A
LX8-F8MW	1300	15	220/240V	6A
LX8-F8QW			380/440V	4A

* 50/60Hz , θ = 20 °C


A1
L1 L2 L3
A2
T1 T2 T3
"I"
LC1-F
"I"
"0"
A1
L1 L2 L3
A2
T1 T2 T3
"0"



Contrôle d'usure des contacts
CONTACT WEAR INDICATOR
PRUFUNG DER ABNUTZUNG DER KONTAKTE
CONTROLLO DELLO STATO DI USURA DEI CONTATTI
CONTROL DEL DESGASTE DE LOS CONTACTOS



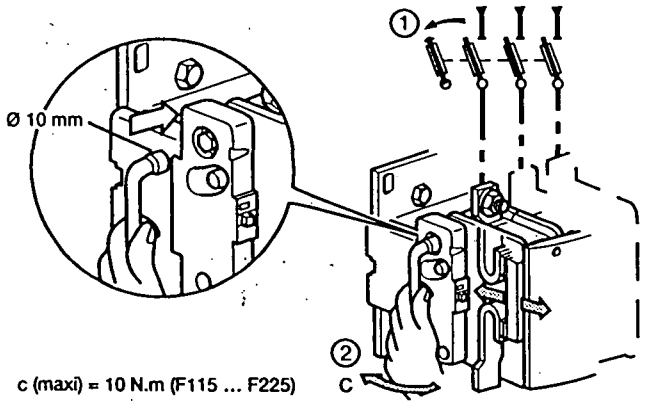
- Le noircissement des contacts et des boitiers d'arc est un phénomène naturel qui n'altère pas le fonctionnement de l'appareil.

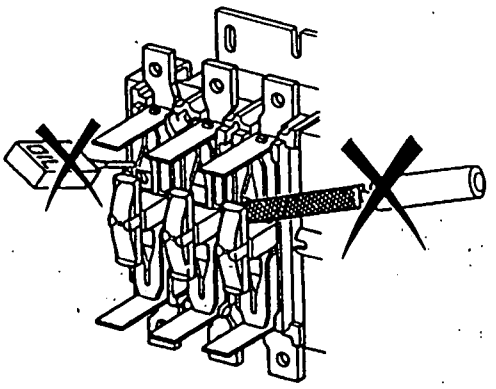
- THE BLACKENING OF THE CONTACTS AND THE ARC-BOXES IS A NATURAL CONSEQUENCE WHICH OCCURS DURING NORMAL OPERATION, AND DOES NOT EFFECT THE FUNCTIONING OF THE PRODUCT.

- DIE SCHWÄRZUNG AN DEN KONTAKTEN UND IN DER LICHTBOGENKAMMER IST EIN NORMALES PHÄNOMEN UND HAT KEINE AUSWIRKUNGEN AUF DIE FUNKTIONSWEISE DES GERÄTES.

- L'ANNERIMENTO DEI CONTATTI E DELLE CAMERE SPEGNI-ARCO È UN FENOMENO NATURALE CHE NON ALTERA IL FUNZIONAMENTO DEL L'APPARECCHIO.

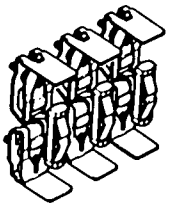
- EL ENNEGRECIMIENTO DE LOS CONTACTOS Y DE LAS CÁMARAS DE ARCO ES UN FENÓMENO NATURAL QUE NO ALTERA EL FUNCIONAMIENTO DEL APARATO.



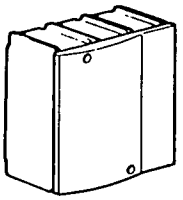


⚠ DANGER / PELIGRO / DANGER

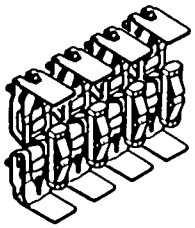
HAZARDOUS VOLTAGE	TENSION PELIGROSA	TENSION DANGEREUSE
Disconnect all power before servicing equipment. Electric shock will result in death or serious injury	Desenergice el equipo antes de realizarte servico. Una descarga eléctrica podrá causar la muerte o lesiones serias.	Coupez l'alimentation avant de travailler sur cet appareil. Une électrocution entrainera la mort ou des blessures graves.



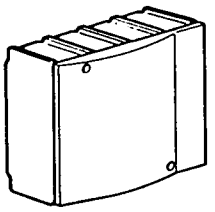
LA5-FF431 (F115/F150)
LA5-FG431 (F185/F225)
LA5-FH431 (265)



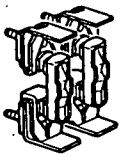
LA5-F11550 (F115)
LA5-F15050 (F150)
LA5-F18550 (F185)
LA5-F22550 (F225)
LA5-F26550 (F265)



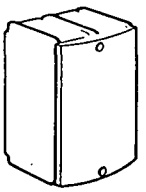
LA5-FF441 (F1154/F1504)
LA5-FG441 (F1854/F2254)
LA5-FH441 (F2654)



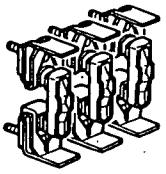
LA5-F115450 (F1154)
LA5-F150450 (F1504)
LA5-F185450 (F1854)
LA5-F225450 (F2254)
LA5-F265450 (F2654)



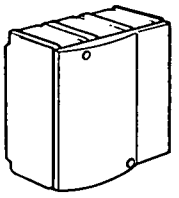
LA5-F400802 (F4002)
LA5-F500802 (F5002)



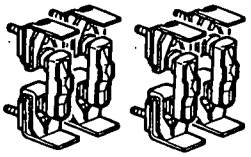
LA5-F400250 (F4002)
LA5-F500250 (F5002)



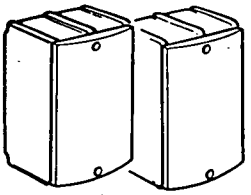
LA5-F400803 (F330/F400)
LA5-F500803 (F500)



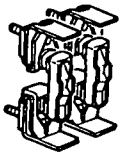
LA5-F33050 (F330)
LA5-F40050 (F400)
LA5-F50050 (F500)



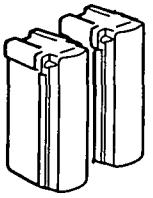
LA5-F400804 (F3304/F4004)
LA5-F500804 (F5004)



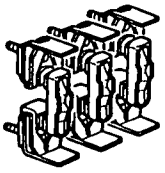
LA5-F330450 (F3304)
LA5-F400450 (F4004)
LA5-F500450 (F5004)



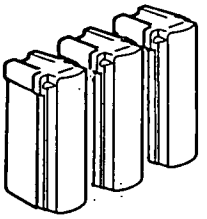
LA5-F630802 (F6302)



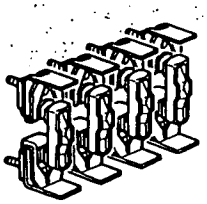
LA5-F630250 (F6302)



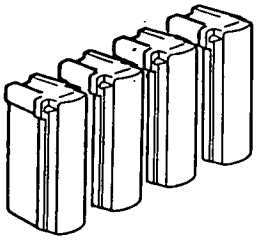
LA5-F630803 (F630)
LA5-F800803 (F800)



LA5-F63050 (F630)
LA5-F80050 (F800)



LA5-F630804 (F6304)



LA5-F630450 (F6304)

SJ ELECTRIC

TECHNICAL DATA SHEET

For

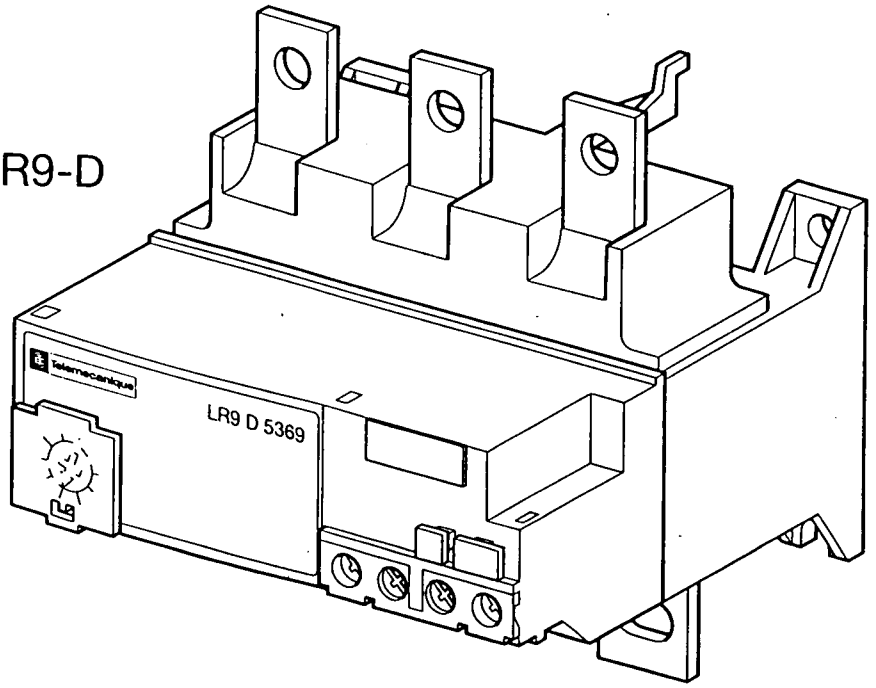
Cockle Street Pump Station

Equipment Type:	Electronic Overload
Location:	Pump Starters
Model Numbers:	LR9-F7375
Manufacturer:	Telemecanique
Supplier:	Schneider Electric. 30 Graystone Street TINGALPA QLD 4173 Ph: 07 3890 2112 Fx: 07 3890 2098

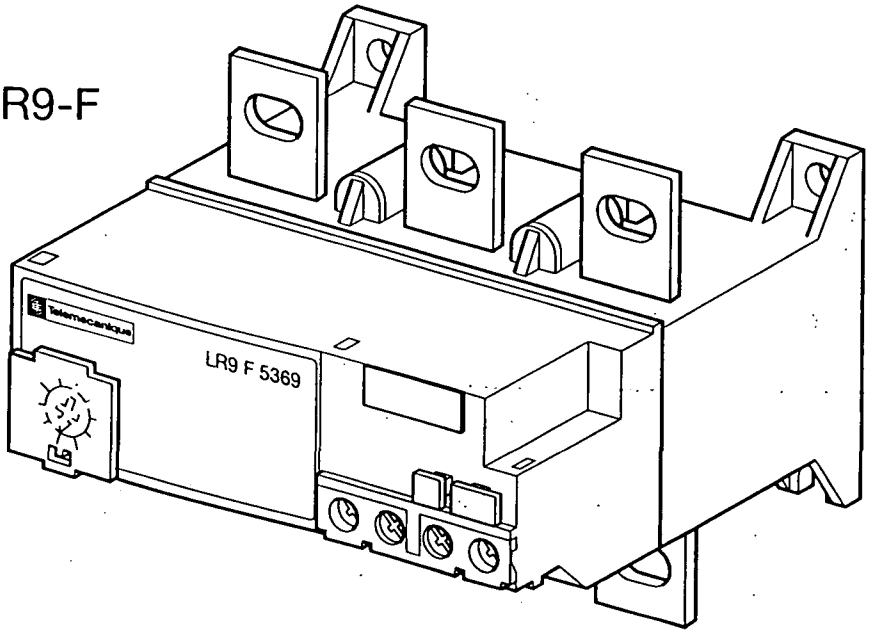
Telemecanique

LR9-D, LR9-F

LR9-D



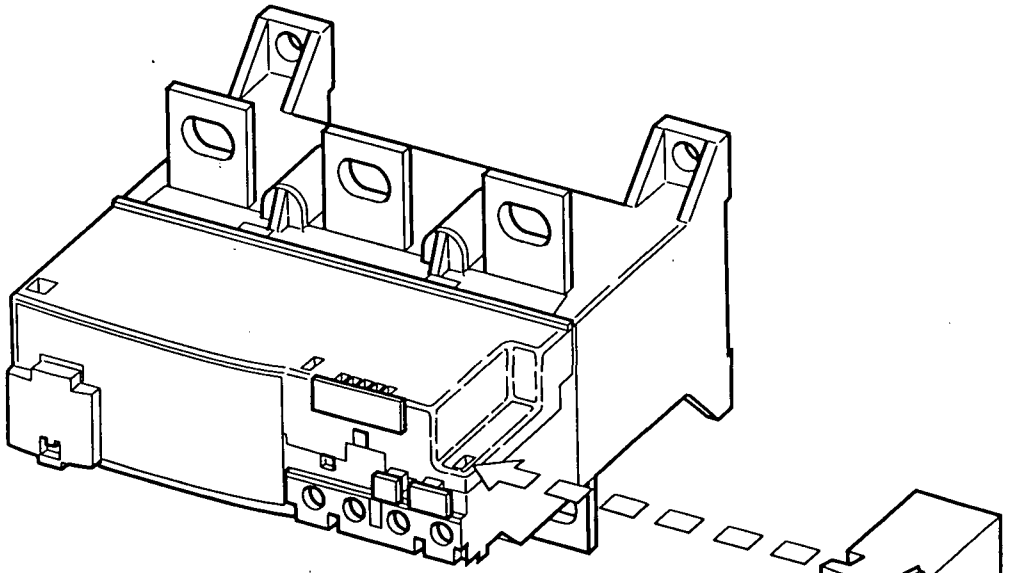
LR9-F



W9 1378620 01 41 A06

Schneider Electric

LR9-D, LR9-F

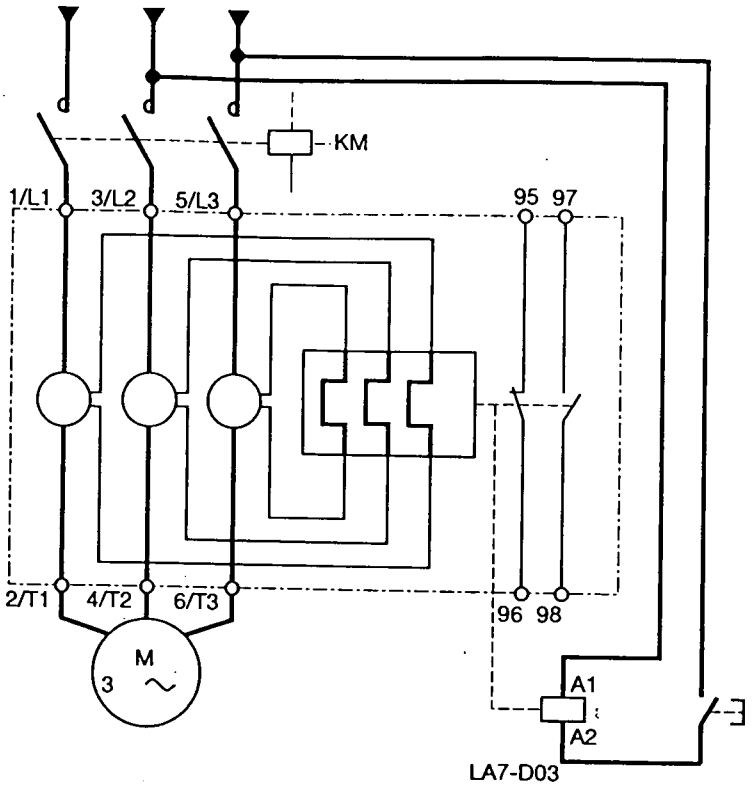


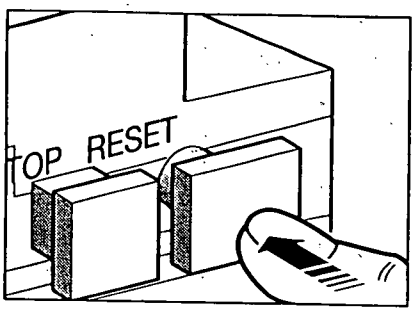
LA7-D03

Réarmement électrique à distance
Remote electrical reset
Fernrückstellung
Rearme electrico a distancia

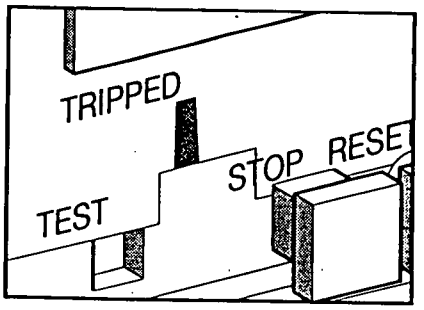
50/60 Hz	24 V	LA7-D03 B
	48 V	LA7-D03 E
	110 V	LA7-D03 F
	220/230 V	LA7-D03 M
	380/400 V	LA7-D03 Q
	415/440 V	LA7-D03 N

LR9-D, LR9-F

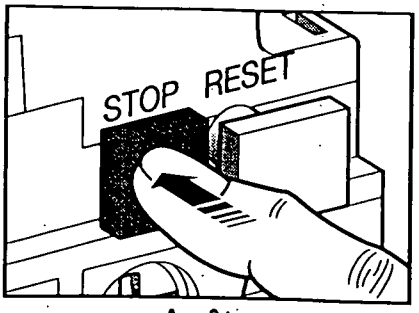




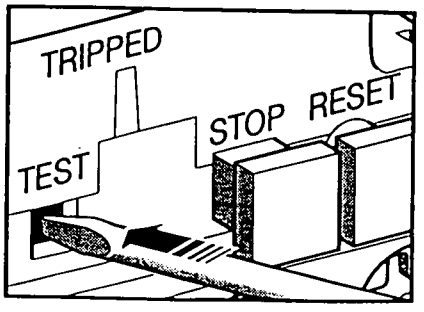
Réarmement
Reset
Wiedereinschalten
Rearme



Témoin de déclenchement
Trip indicator
Auslösungsmelder
Indicador de disparo

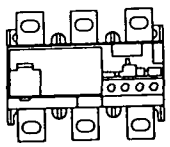


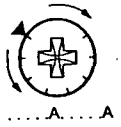
Arrêt
Stop
Stillstand
Parada



Test
Test
Test
Prueba

LR9-D, LR9-F





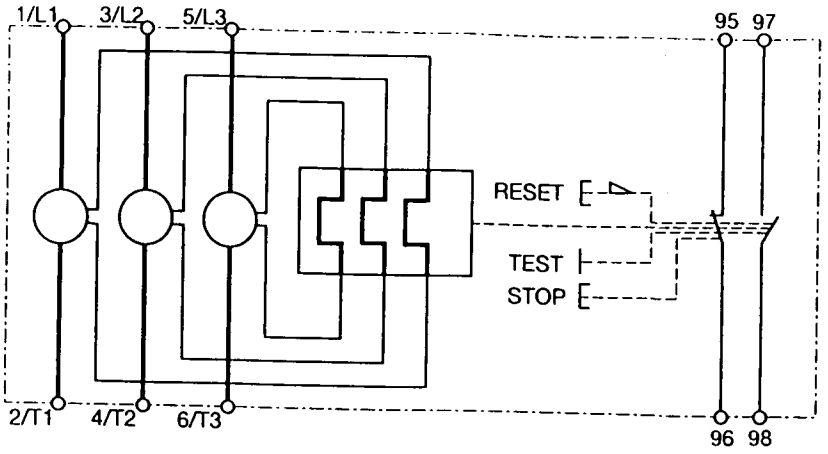
3~ (1) 50/60 Hz

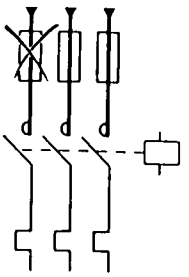
(2)

		220V kW	380V kW	415V kW	440V kW	500V kW	660V kW	1000V kW	Class10 aM(A)	Class20 aM(A)
LR9-F5•57 LR9-F57	30...50	9 11	15 18,5 22	18,5 22	18,5 22	22 30	-	45 55	50	80
LR9-F5•63 LR9-F63	48...80	15 18,5 22	30 37	30 37 45	30 37 45	37 45 55	45 55	75 90 110	80	100
LR9-D5•67 LR9-F5•67 LR9-D67 LR9-F67	60...100	18,5 22	30 37 45	37 45 55	37 45 55	45 55	55 75 90	90 110 132	100	125
LR9-D69 LR9-D5•69 LR9-F5•69 LR9-F69	90...150	30 37 45	55 75	55 75	55 75 90	75 90	110 132	132 160 200	160	200
LR9-F5•71 LR9-F71	132...220	45 55	75 90 110	75 90 110	90 110 132	110 132 160	132 160 200	200 220 250 280	250	315
LR9-F7•75 LR9-F75	200...330	75 90	110 132 160	110 132 160	132 160 200	160 200 220	200 220 250	250 280 315 355 400 450	400	400
LR9-F7•79 LR9-F79	300...500	110 132	160 200 220 250	200 220 250	200 220 250	220 250 315 355	315 355 400	450 500 560 630 710	500	630
LR9-F7•81 LR9-F81	380...630	132 160 200	220 250 280 315	220 250 315 355	250 315 355 400	315 355 400	400 500 560	560 630 710 800 900	630	800

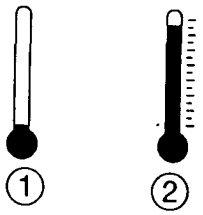
(1) Refer to catalog for HP sizes.
(2) For North America installations, refer to National Electric Code for proper upstream fusing sizes.

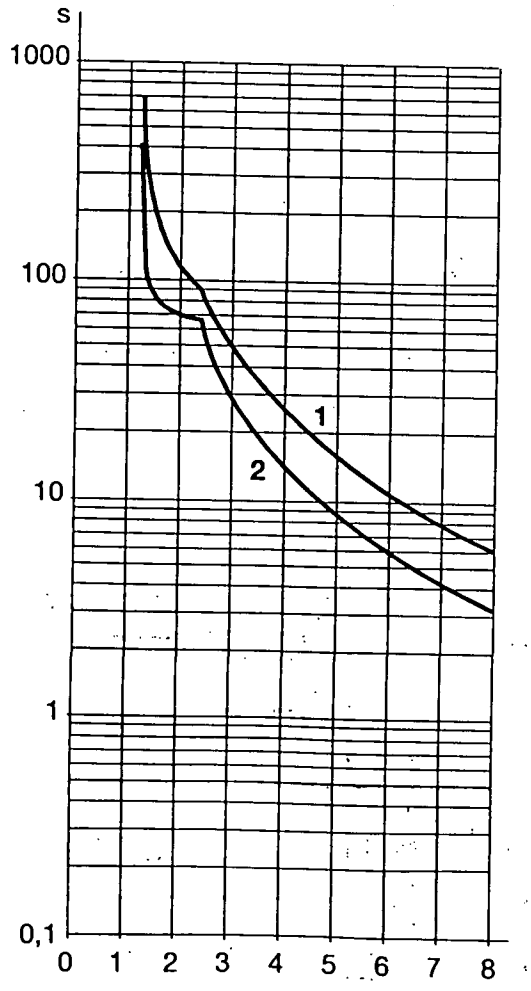
LR9-D, LR9-F





Temps de déclenchement : 4s
Tripping time : 4s
Auslösungszeit : 4s
Tiempo de disparo : 4seg

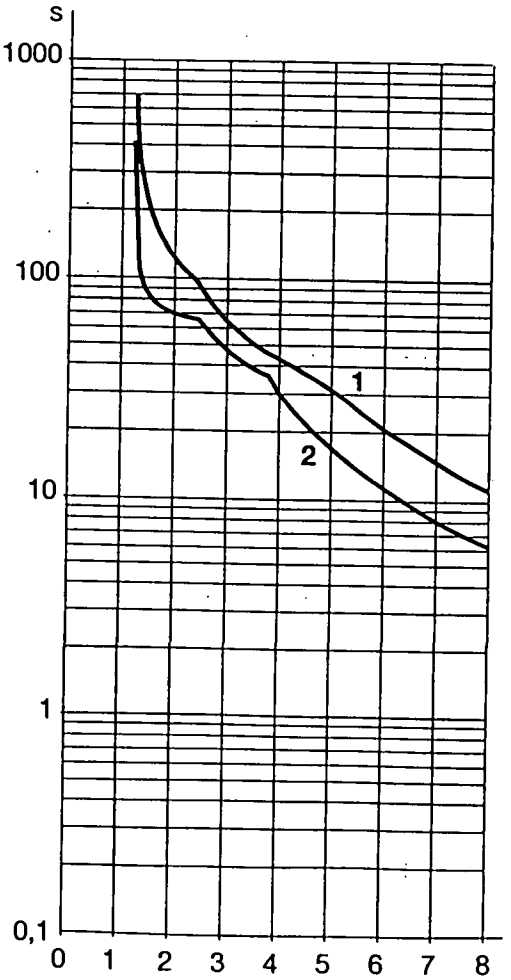




Classe 10
Class 10
Klass 10
Clase 10

LR9D●3●●
LR9F●3●●

LR9D●● 20 ... class 10
LR9F●●



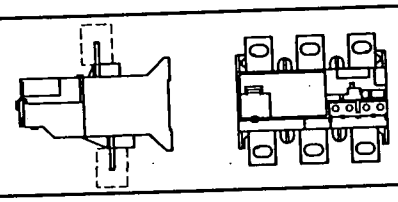
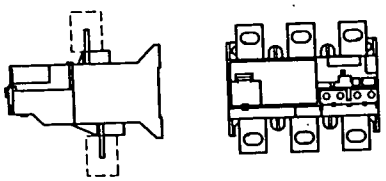
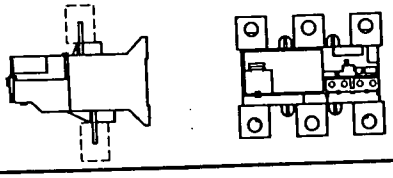
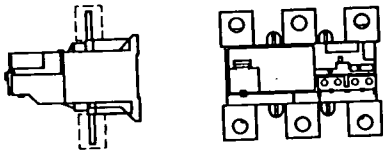
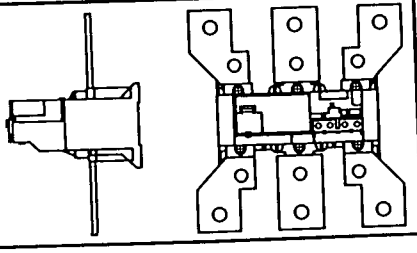
Classe 20
Class 20
Klass 20
Clase 20

LR9D●5●●
LR9F●5●●

LR9D●● 20 class 10
LR9F●●

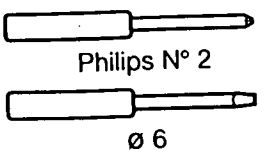
LR9-D, LR9-F

Câblage puissance
Power wiring
Leistungsanschluss
Cableado de potencia

			C lb.in.	C Nm	A / B mm	S (1) mm²
LR9-F5•57 / F57		M6	88	10	A : 20 B : 10 S : 35 mm² S : 2 AWG	
LR9-F5•63 / F63 LR9-F5•67 / F67 LR9-F5•69 / F69		M8	160	18	A : 20 B : 10 S : 95 mm² S : 3/0 AWG	
LR9-D5•67 / D67 LR9-D5•69 / D69			100	12		
LR9-F5•71 / F71		M10	310	35	A : 25 B : 12,5 S : 150 mm² S : 300 MCM	
LR9-F7•75 / F75 LR9-F7•79 / F79		M10	310	35	A : 30 (7•75) A : 40 (7•79) B : 15 S : 2 x 185 mm² S : 2 x 350 MCM	
LR9-F7•81 / F81		M12	515	58	A : 40 B : 20 S : 2 x 240 mm² S : 2 x 500 MCM	

Câblage contrôle
Control wiring
Steuerstrom
Cableado de control

Raccordement mini ... maxi
Wiring min ... max.
Anschlüsse min ... max.
Capacidad de conexion min ... max.



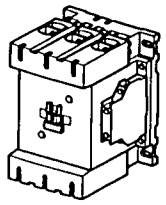
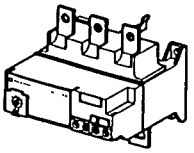
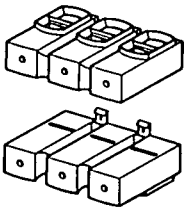
	mm²	mm²	mm²	mm²	AWG	AWG	mm²	mm²	mm	C lb.in.	C N.m	L mm	Ø mm
	0,75 : 2,5	1...1,5 + 1...1,5	0,75 : 4	1...2,5 + 1...2,5	18 : 12	16...14 + 16...14	0,75 : 2,5	1 + 1	8	10,5	1,2	7,5	3,5

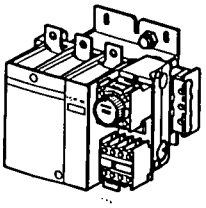
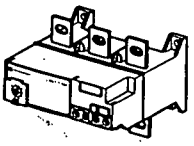
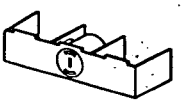
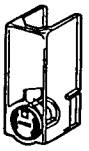
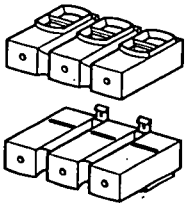
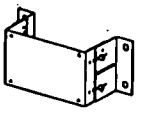
Note : (1) For box lug selection and wire sizing, see device label or product catalog.

LR9-D, LR9-F

Montage direct LR9- sur contacteurs LC1- en câblage DOL
Direct installation of LR9- on contactor LC1-
Direktmontage LR9- an Schütz LC1- als Direhtanlasser
Montaje directo LR9- en contactor LC1- en cable DOL

LR9-D•

LC1-D•••	LR9-D•••			LA9-F103	
					
LC1-D115/D150 LC2-D115/D150	LR9-D5•67/D67 LR9-D5•69/D69			LA9-F103 LA9-F103	

LR9-F•••					
LC1-F•••	LR9-F•••	LA7-F7••	LA9-F7••	LA9-F103	LA7-F9••
			6 x 		
LC1-F115 LC1-F150 LC1-F185	LR9-F5•57/F57 LR9-F5•63/F63 LR9-F5•67/F67 LR9-F5•69/F69	LA7-F701 LA7-F701 LA7-F701 LA7-F701	LA9-F701 LA9-F702 LA9-F702 LA9-F702	LA9-F103* LA9-F103* LA9-F103* LA9-F103*	LA7-F901* LA7-F901* LA7-F901* LA7-F901*
LC1-F225 LC1-F265	LR9-F5•71/F71 LR9-F7•75/F75 LR9-F7•79/F79	LA7-F702 LA7-F703 LA7-F703	LA9-F705 LA9-F703 LA9-F703		LA7-F901* LA7-F902 LA7-F902
LC1-F330	LR9-F7•75/F75 LR9-F7•79/F79**	LA7-F703 LA7-F703	LA9-F703 LA9-F703		LA7-F902 LA7-F902
LC1-F400	LR9-F7•75/F75 LR9-F7•79/F79** LR9-F7•81/F81**	LA7-F703 LA7-F703 LA7-F703	LA9-F703 LA9-F703 LA9-F703		LA7-F902 LA7-F902 LA7-F902
LC1-F500	LR9-F7•75/F75** LR9-F7•79/F79 LR9-F7•81/F81	LA7-F703 LA7-F703 LA7-F703	LA9-F703 LA9-F703 LA9-F703		LA7-F902 LA7-F902 LA7-F902
LC1-F630	LR9-F7•81/F81***				LA7-F902
LC1-F185	+ LR9-F5•71/F71 +	LA7-F407			

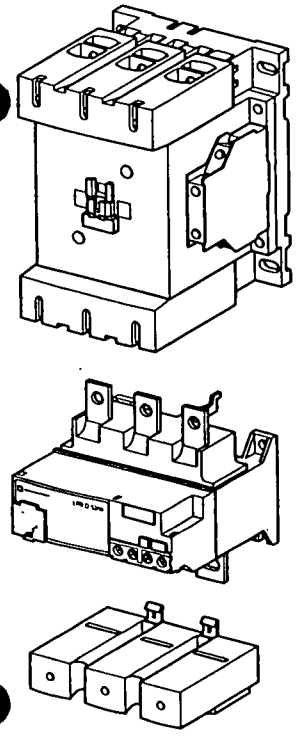
*non obligatoire
Not mandatory
Nicht obligatorisch
No obligatorio

**avec inversion des barres extrêmes
With inversion of end bars
Mit Drehung der Anschlusschienen
Con inversión de las barras de extremos

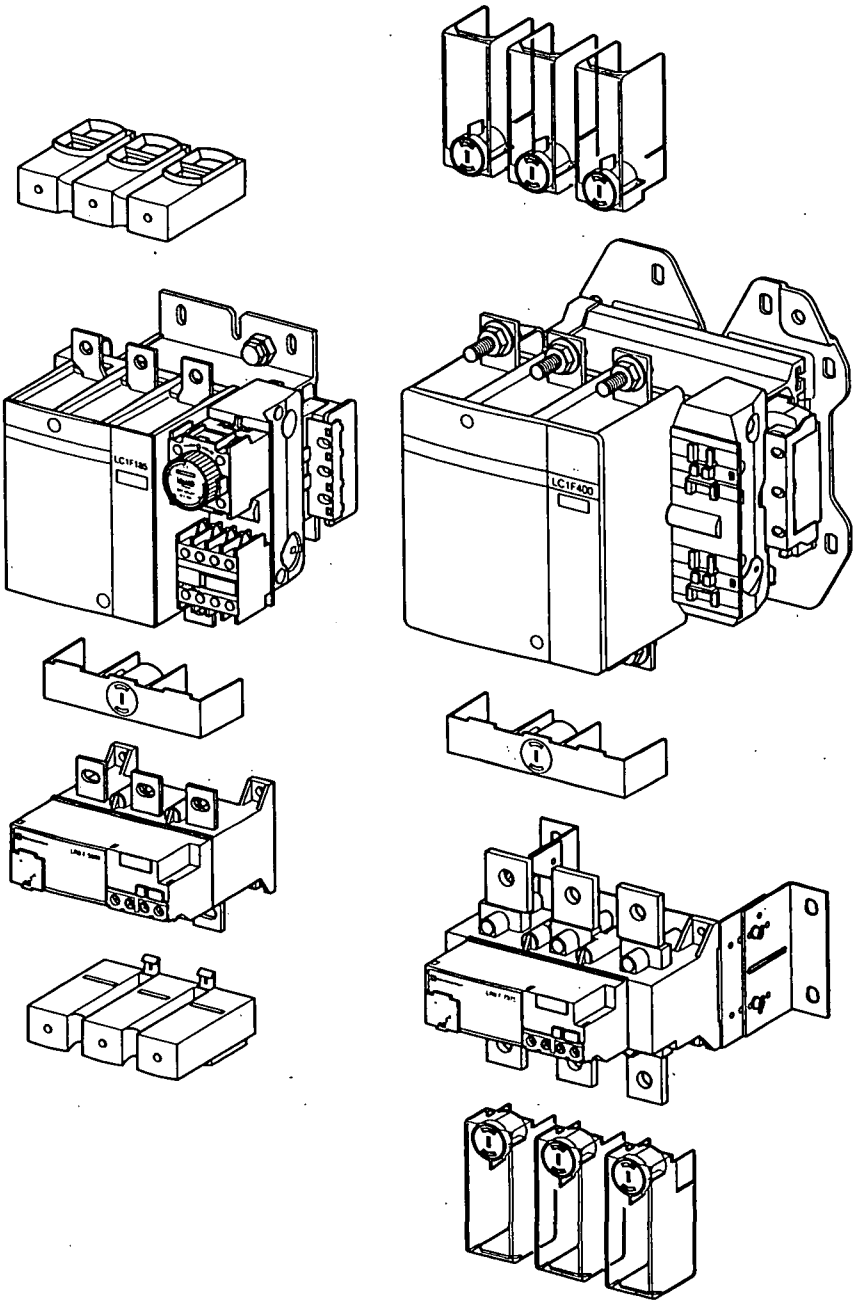
***avec épanouisseurs fournis avec le LR9-F7•81
With flaring devices supplied with LR9-F7•81
Erweiterungen zum Lieferumfang LR9-F7•81 gehörend
Con desarrollarodes suministrados con el LR9-F7•81

LR9-D, LR9-F

LR9-D

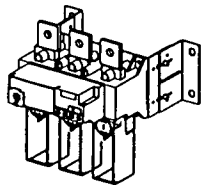


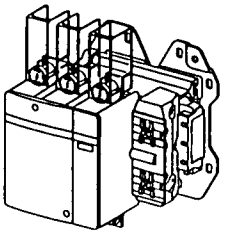
LR9-F

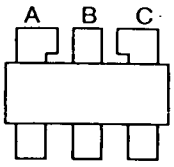
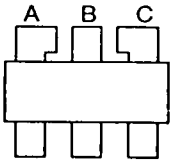
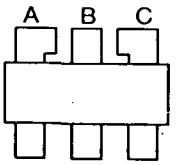
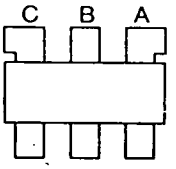
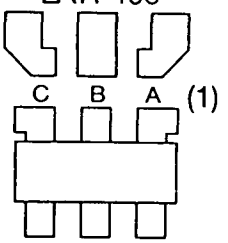
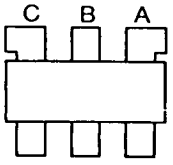
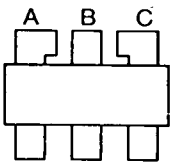
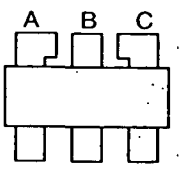
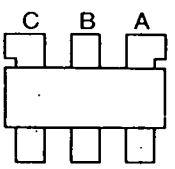
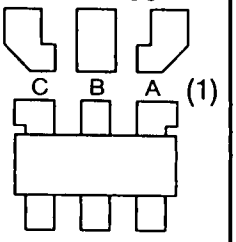
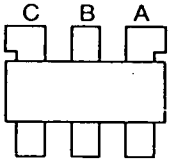
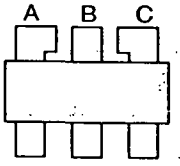
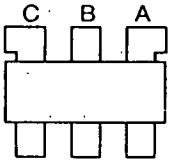
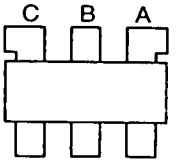


LR9-D, LR9-F

Montage des LR9-F7• • • sous contacteurs LC1F
Installation of LR9-F7• • • under contactors LC1-F
Montage der LR9-F7• • • unter das Schütz LC1F
Montaje de los LR9-F7• • • con contactores LC1F

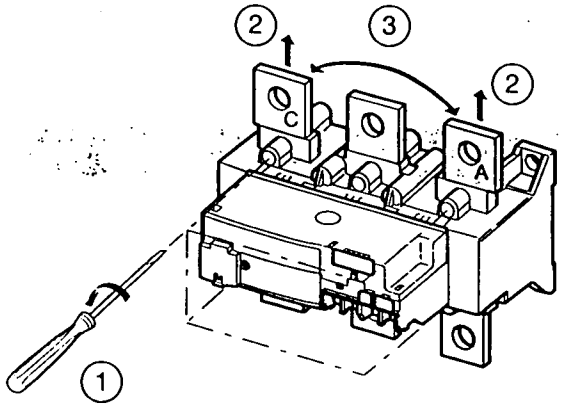


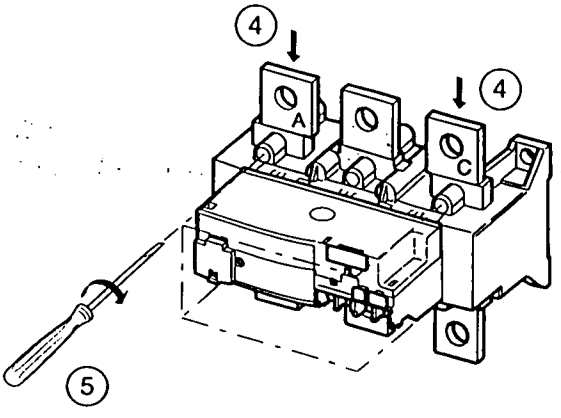


Original	LC1-F265/F330	LC1-F400	LC1-F500	LC1-F630
LR9F-7•75 			(1) 	LA7F406  (1)
LR9F-7•79 	(1) 	(1) 		LA7F406  (1)
LR9F-7•81 		(1) 		(2) 

(1) Inverser les barres extrêmes
Reverse the end bars
Anschlusschienen umdrehen
Invertir las barras de extremos

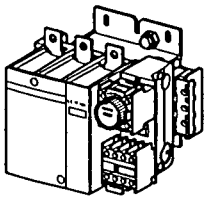
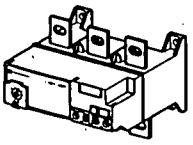
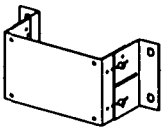
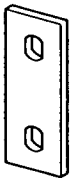
(2) Avec épanouisseurs fournis
With flaring devices supplied
Erweiterungen in Lieferumfang
Con desarrolladores suministrados





LR9-D, LR9-F

Montage direct LR9 sur contacteurs LC1 en câblage inverseur ou étoile-triangle
Direct installation of LR9 on contactors, with reversing cable or star-delta connection
Direktmontage LR9 an Schütz LC1 Wende-oder Stern-Dreieck-Anlasser
Montaje directo LR9 en contactores en cableado inversor o estrella triángulo

			
LC1-F115	LR9-F5•57/F57	LA7-F901	LA7-F401
LC1-F115	LR9-F5•63/F63	LA7-F901	LA7-F401
LC1-F115	LR9-F5•67/F67	LA7-F901	LA7-F401
LC1-F115	LR9-F5•69/F69	LA7-F901	LA7-F401
LC1-F150	LR9-F5•57/F57	LA7-F901	LA7-F402
LC1-F185	LR9-F5•63/F63	LA7-F901	LA7-F402
LC1-F185	LR9-F5•71/F71	LA7-F901	LA7-F407
LC1-F225	LR9-F5•71/F71	LA7-F901	LA7-F403
LC1-F265	LR9-F7•75/F75	LA7-F902	LA7-F404
	LR9-F7•79/F79	LA7-F902	LA7-F404
LC1-F330	LR9-F7•75/F75	LA7-F902	LA7-F404
LC1-F330	LR9-F7•79*/F79*	LA7-F902	LA7-F404
LC1-F400	LR9-F7•75/F75	LA7-F902	LA7-F404
LC1-F400	LR9-F7•79*/F79*	LA7-F902	LA7-F404
LC1-F400	LR9-F7•81*/F81*	LA7-F902	LA7-F404
LC1-F500	LR9-F7•75/F75	LA7-F902	LA7-F405
LC1-F500	LR9-F7•79*/F79*	LA7-F902	LA7-F405
LC1-F500	LR9-F7•81*/F81*	LA7-F902	LA7-F405
LC1-F630	LR9-F7•81/F81	LA7-F902	LA7-F406
LC1-D115	LR9-D5•67/D67	–	–
	LR9-D5•69/D69	–	–
LC1-D150	LR9-D5•67/D67	–	–
	LR9-D5•69/D69	–	–

*avec inversion des barres extrêmes.
With inversion of end bars.
Mit Drehung der Anschlusschienen.
Con inversión de las barras de extremos.

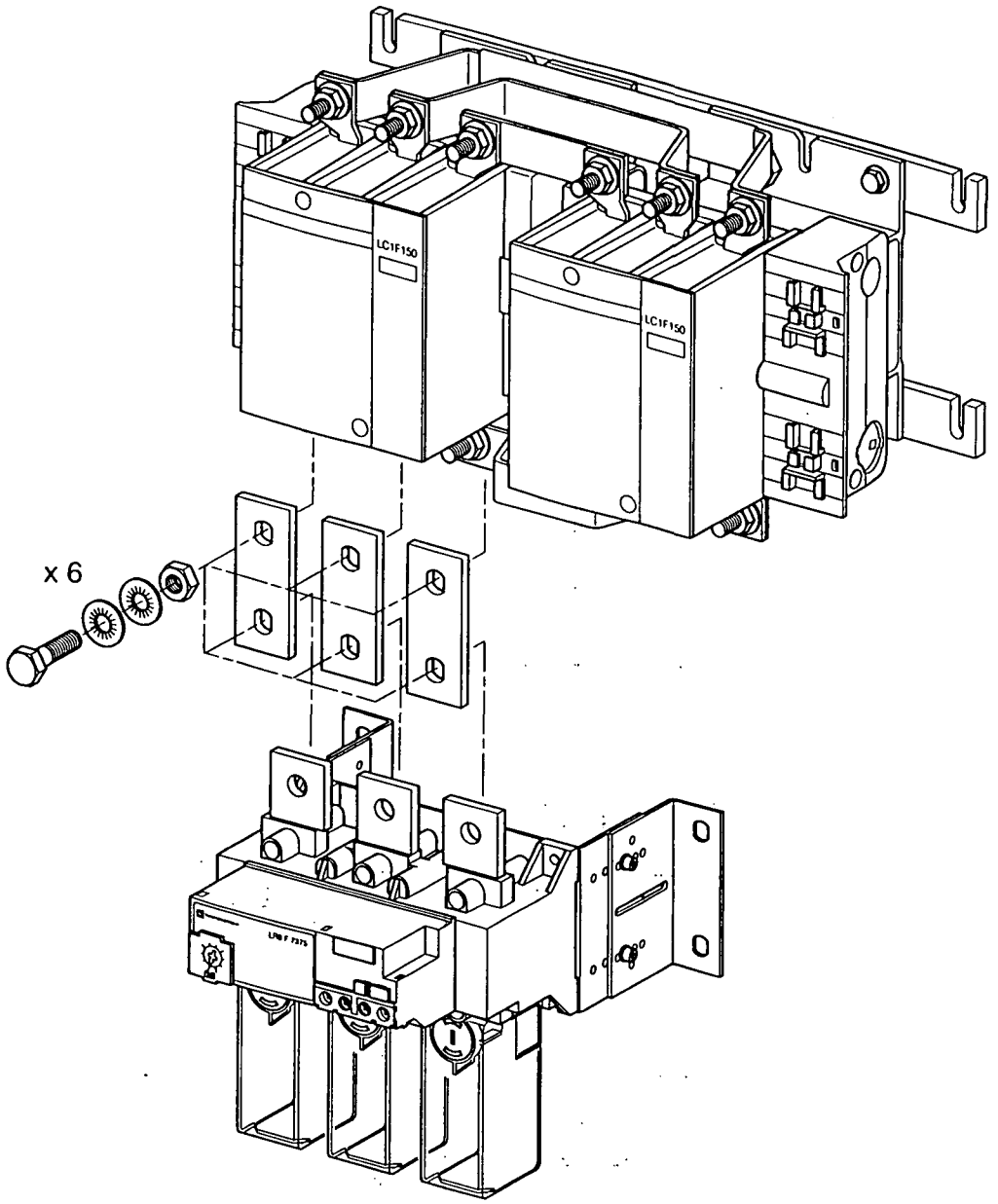
⚠ DANGER / PELIGRO / DANGER

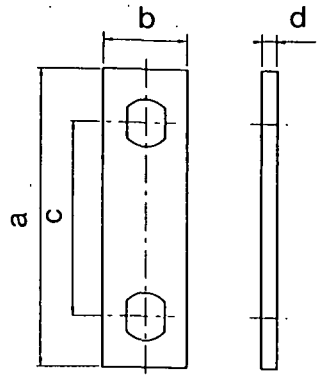
HAZARDOUS VOLTAGE
Disconnect all power before servicing equipment.
Electric shock will result in death or serious injury.

TENSION PELIGROSA
Desenergica el equipo antes de realizaria servico.
Una descarga eléctrica podrá causar la muerta o lesiones serías.

TENSION DANGEREUSE
Coupez l'alimentation avant de travailler sur cet appareil.
Une électrocution entrainerait la mort ou des blessures graves.

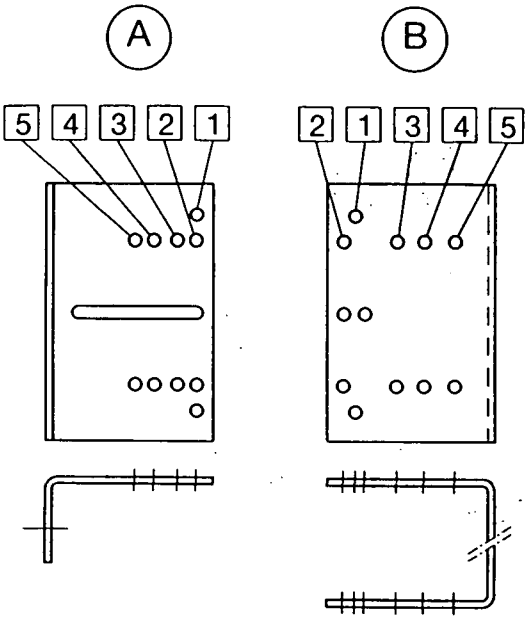
LR9-D, LR9-F





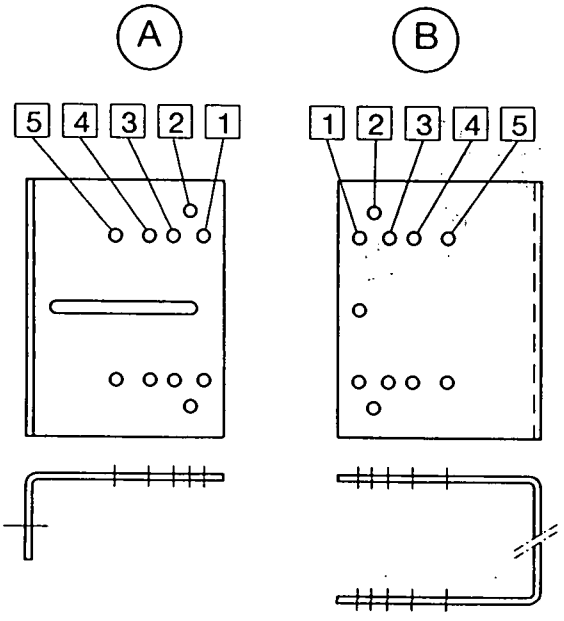
	a	b	c	d
LA7-F401	58,5	16	38,5	3
LA7-F402	56	20	36	3
LA7-F403	77,5	25	49,5	4
LA7-F404	76	25	48	4
LA7-F405	74	30	44	6
LA7-F406	93,9	40	55,9	6

LR9-D, LR9-F



LA7 - F901

LC1	DOL		Reversing-⅄/Δ	
	A	B	A	B
F115	4	4	5	3
F150	4	4	5	3
F185	3	4	2	5
F225	3	4	2	5
F285	2	2	1	1

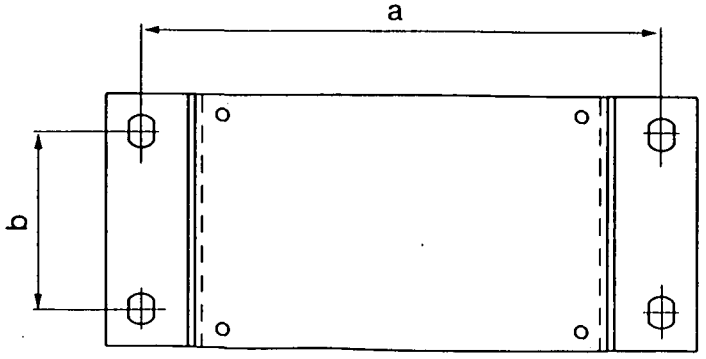


LA7 - F902

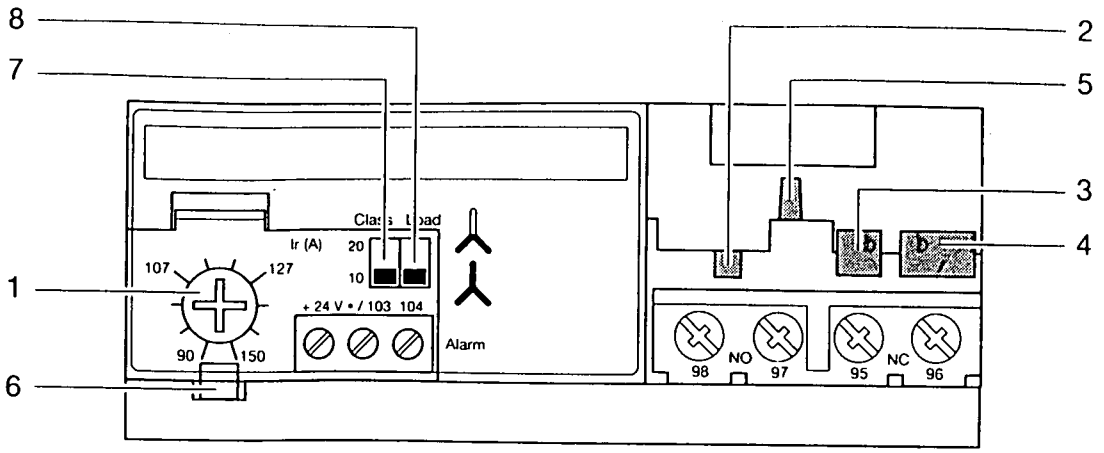
LC1	DOL		Reversing-⅄/Δ	
	A	B	A	B
F225	4	5	5	5
F265	4	1	5	1
F330	1	3	3	3
F400	2	2	1	4
F500	1	3	3	3
F630	3	1	3	1

(mm)	a	b
LA7-F901	145	50
LA7-F902	190	58

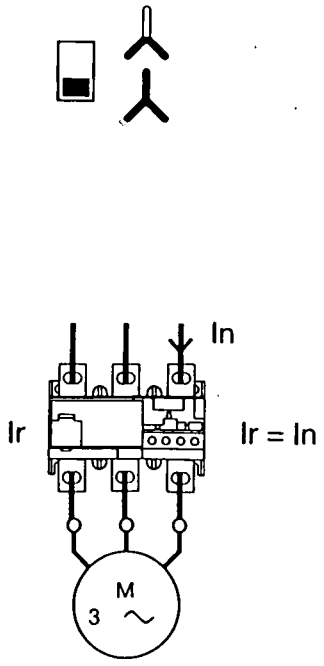
(mm x 0.0394 = inches)

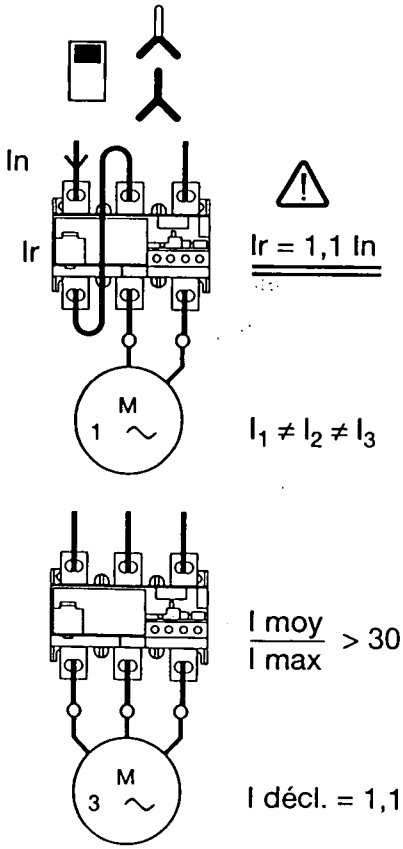


LR9-D, LR9-F

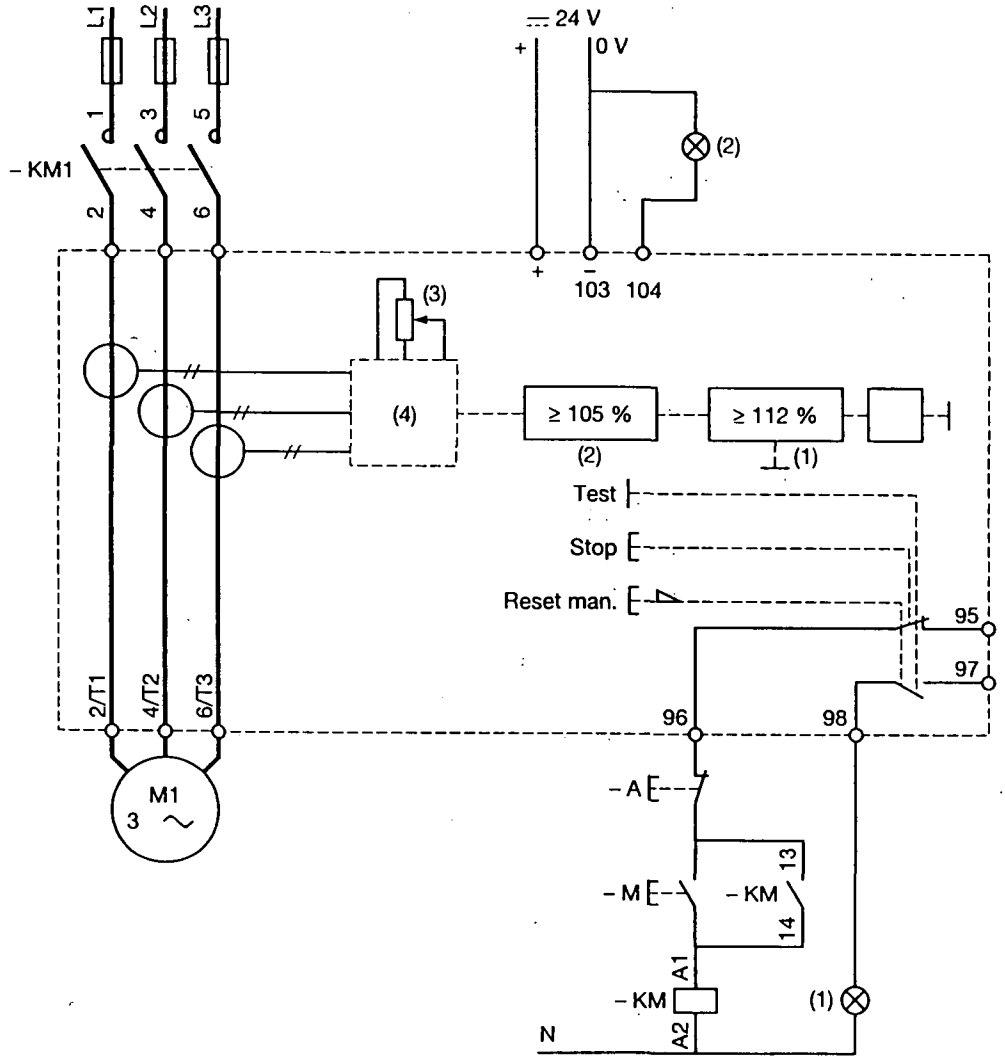


1) Réglage du relais / Overload adjustment / Einstellung des Relais / Regulacion del rele
2) Test / Test / Test / Prueba
3) Arrêt / Stop / Stillstand / Parada
4) Réarmement / Resrt / Wiedereinschalten / Rearme
5) Témoin de déclenchement / Trip indicator / Auslösungsmelder / Indicator de disparo
6) Verrouillage du réglage (capot plombable) / Sealed adjustment (sealing cover) / Einstellung Abdeckbar (Plombiernarar Deckel) / Precintado del ajuste (capo de precintado)
7) Commutateur Classe 10 - Classe 20 / Class 10 - Class 20 switch / Klass 10 - Klass 20 Kommutator / Conmutador Clase 10 - Clase 20
8) Commutateur charge équilibrée-charge déséquilibrée / Balanced load-unbalanced load switch / Symmetrische Belastung-Unsymmetrische Belastung Kommutator / Conmutador carga equilibrada-carga desequilibrada





LR9-D, LR9-F



1) Déclenché / Tripped / auslösen/ soltado

2) Alarme / Alarm / Alarm / Alarma

3) Courant de réglage / Setting current / Einstellbereich / Corriente de ajuste

4) Circuit spécialisé / Specialised circuit / Spezial Schalt / Circuito especializado

SJ ELECTRIC

TECHNICAL DATA SHEET

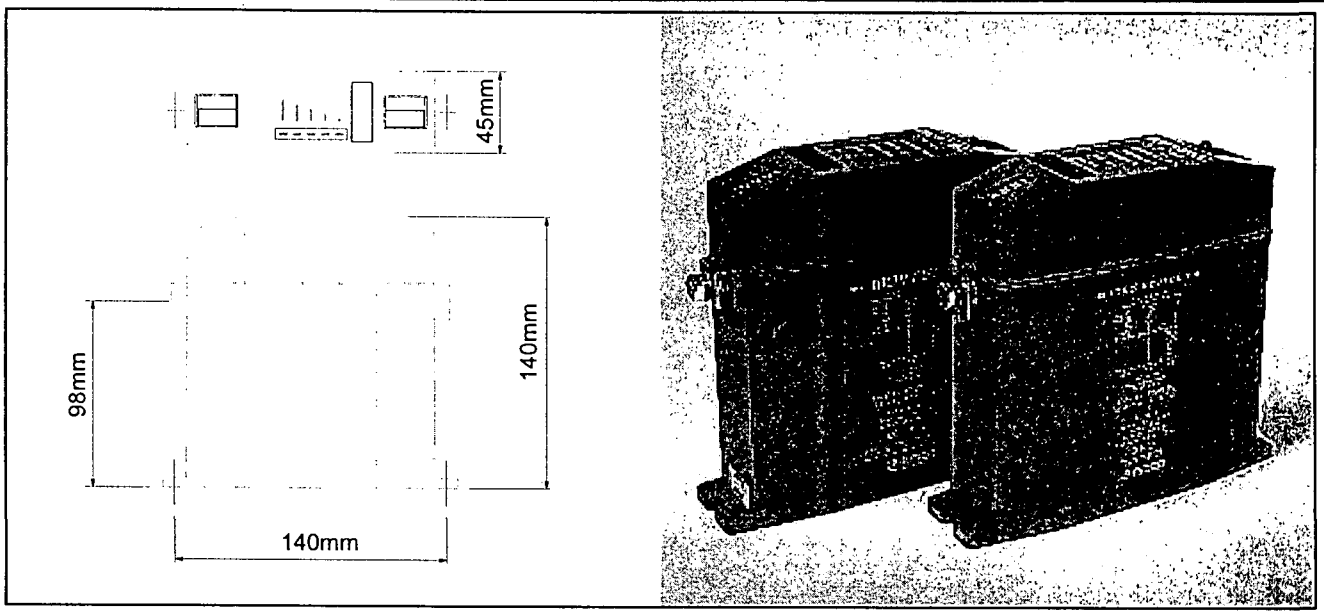
For

Cockle Street Pump Station

Equipment Type:	Surge Diverter
Location:	Main Incomer
Model Numbers:	TDS-MT-277
Manufacturer:	Critec
Supplier:	SCA Distributors 178 Wecker Road MANSFIELD QLD 4122 Ph: 07 3849 5077 Fx: 07 3849 7035

FACILITY ELECTRICAL PROTECTION

CRITEC™



Detailed Specifications for ERICO's TDS-MOVTEC SURGE DIVERTER TDS-MT-277

Applications

Lightning transients and surges are a major cause of expensive electronic equipment failure and business disruption. Damage may result in loss of computers, data and communications, loss of revenue, and loss of profits. The new TDS-MOVTEC family of surge diverters offer economical and reliable protection from power transients in even the most strenuous applications.

Transient Discriminating Technology (TDS) introduces the first quantum leap in transient suppression technology for mains powered equipment. It offers a new level of safety and reliability, yet retains optimum protection levels critical for electronic equipment. TDS is an active frequency based device that discriminates between the slower mains voltages and the higher speed transients. When transient frequencies are detected the patented TDS "Quick-Switch" technology "switches in" robust protection devices to limit the transient to safe levels. The frequency discrimination circuit controlling the TDS "Quick-Switch" ensures that the device is virtually immune to the effects of the 50/60Hz sustained over-voltages, allowing fault voltages of up to 480Vrms without degradation, and providing over-voltage robustness in excess of the demanding new and emerging standards.

TDS technology is essential for any site where abnormal over-voltages can occur or where the possible catastrophic failure of traditional technologies due to over-voltage events can not be tolerated.

Since 75% of all lightning strikes comprise multiple strokes through the one air to ground channel, often as little as 30 milliseconds apart, conventional MOVs can rapidly accumulate heat and self destruct just when they are most needed. TDS-MOVTECs are high capacity surge diverters and are the most advanced surge protection devices currently in place to offer low let through levels at sites with poor voltage regulation. Internal electronics continuously monitor TDS-MOVTEC protection, and their status is displayed on a 5-segment LED bar graph. Alarm contacts are provided which may be used to shut down the system or activate an external warning if the internal surge material is below optimum condition.

Features

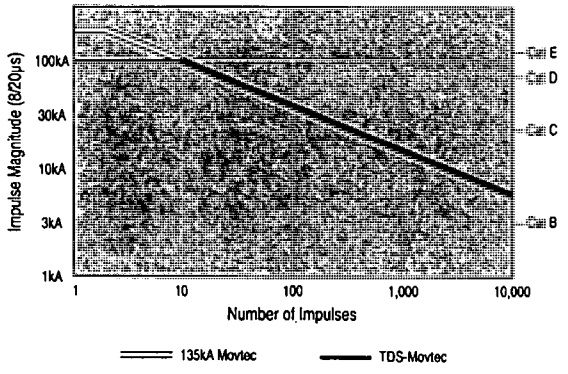
- Robust against abnormal over-voltage
- UL1449 Edition 2 compliant (pending)
- Single phase primary protection for extremly high exposure sites and point-of-entry protection applications
- Single mode protection, configurable to Ph-N, Ph-E or N-E protection
- Small foot print for more effective use of realestate.
- Fail safe voltage free alarm contacts
- 5 segment electronic status indication ideal for poorly illuminated locations
- Long Service life
- Lug terminals for connection of large cables

TDS-MOVTEC SURGE DIVERTER TDS-MT-277

SPECIFICATIONS

Operation:	
Nominal input voltage	220 -277 Vrms
Input frequency	50/60 Hz
Max. permissible abnormal over-voltage	480 Vrms
Power systems	TN-C, TN-S, TN-C-S (MEN), TT
Earth leakage current	<2mA
Protection:	
Modes	Ph-N, Ph-E or N-E
Let through voltage @ 3kA 8/20µs	<740V
Let through voltage @ 20kA 8/20µs	<970V
Surge rating 8/20µs	100kA
Surge rating 10/350µs	20kA
Energy rating	4800J
Multipulse™ capability	Yes
Aggregate surge material	200kA 8/20µs
Alarms and Indicators:	
Protection status indication	5-segment LED bar graph
User configurable alarm contacts	Voltage free relay contact (NO)
Breakdown isolation	4kV
MOVTEC alarm actuation point	≤60% status (two LEDs off)
Physicals:	
Operating conditions	-35 to +55°C, 0-90% humidity
Enclosure style	Proprietry
Dimensions (W x D x H)	45 x 140 x 140mm
Weight	600g (approx.)
Encapsulation	Shockguard
Enclosure material	Flame Retardent UL94V-0
Surface finish	Highly Polished
Wiring terminals	M6 Swift Thread and Bolt
Warranty	5 years
Test standards:	
Approvals	UL1449 Edition 2 (pending) AS 3260, IEC 950 C-Tick Certificate of suitability, Electricity Regulator
Surge rated to meet	ANSI/IEEE C62.41-1991 Cat A, Cat B, Cat C. ANSI/IEEE C62.45-1987 Life cycle testing. AS/NZS 1768-1991 Cat A, Cat.B, Cat C. BS 6651:1992 Cat A, Cat B. IEC801-5 Installation Class 5. IEC 61643-1

Estimated Life of MOVTEC and TDS-MOVTEC



Note: Other operating voltages and frequencies are available on application.
For specifications on other TDS products, refer to relevant Specifications Sheet.
Exceeding nominal operating voltage while transient events occur may affect product life.

Due to a policy of continual product development, specifications are subject to change without notice.

Model Number	Description
TDS-MT-277	TDS MOVTEC 220-277V 100KA

Hobart	ph:+61 3 6237-3200	fax:+61 3 6273-0399	Adelaide	ph:+61 8 8366-6555	fax:+61 8 8366-6556
Sydney	ph:+61 2 9479-8500	fax:+61 2 9980-5092	Perth	ph:+61 8 9358-1233	fax:+61 8 9358-1404
Melbourne	ph:+61 3 9894-2677	fax:+61 3 9894-3216	Singapore	ph:+ 65-763-2477	fax:+ 65 763-2397
Canberra	ph:+61 2 6257-3055	fax:+61 2 6257-3127	Thailand	ph:+ 662 627-9037-8	fax:+662 627-9168

ERICO®

ERICO's coordinated approach to facility protection - CADWELD, CRITEC, ERITECH www.erico.com

TDS-MT.PM5 ISSUE 2.0

SJ ELECTRIC

TECHNICAL DATA SHEET

For

Cockle Street Pump Station

Equipment Type:	Pushbuttons, Indicator Lights &.
Location:	Switchboard Starter Section Common Control
Model Numbers:	ZB Series
Manufacturer:	TELEMECANIQUE
Supplier:	Schneider Electric. 30 Graystone Street TINGALPA QLD 4173 Ph: 07 3890 2112 Fx: 07 3890 2098

Control and signalling units Ø 22

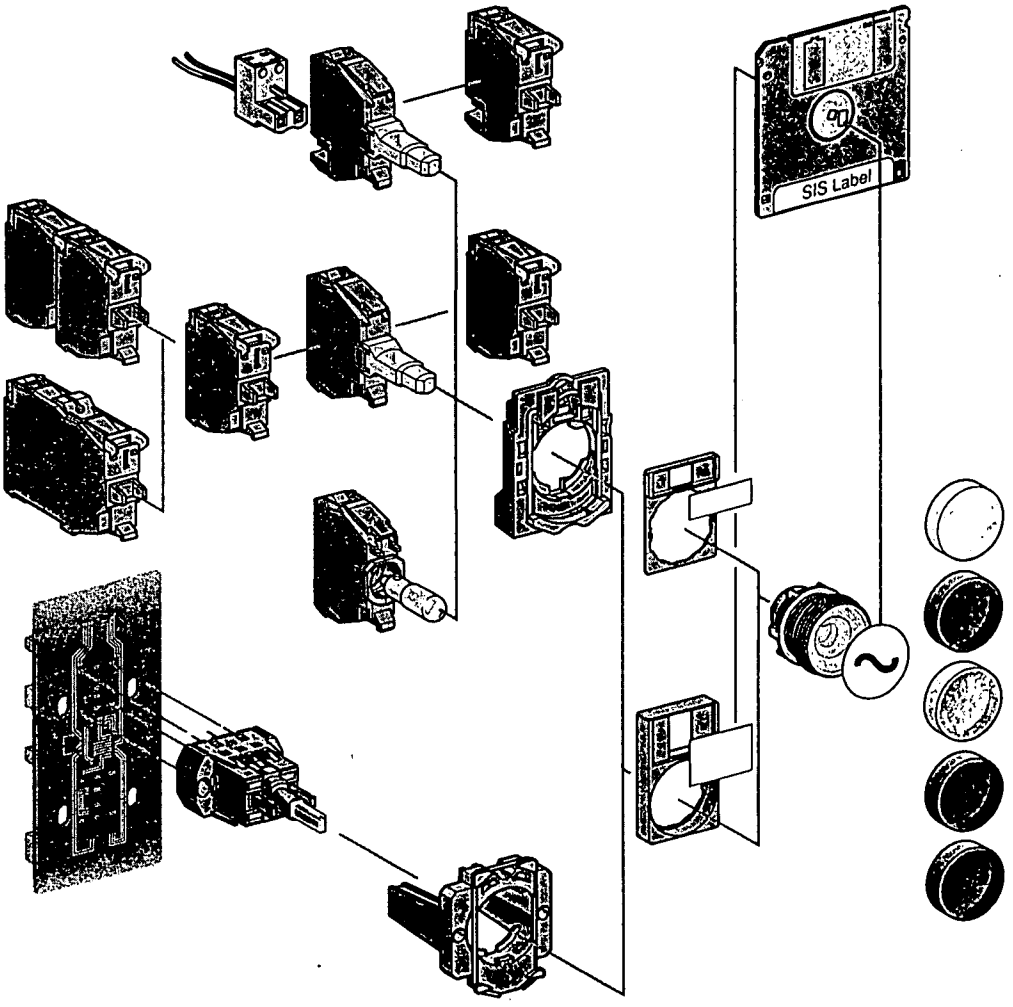
Harmony® style 5
Pushbuttons, switches and pilot lights, with double insulated bezel

Description

Complete units
XB5-A

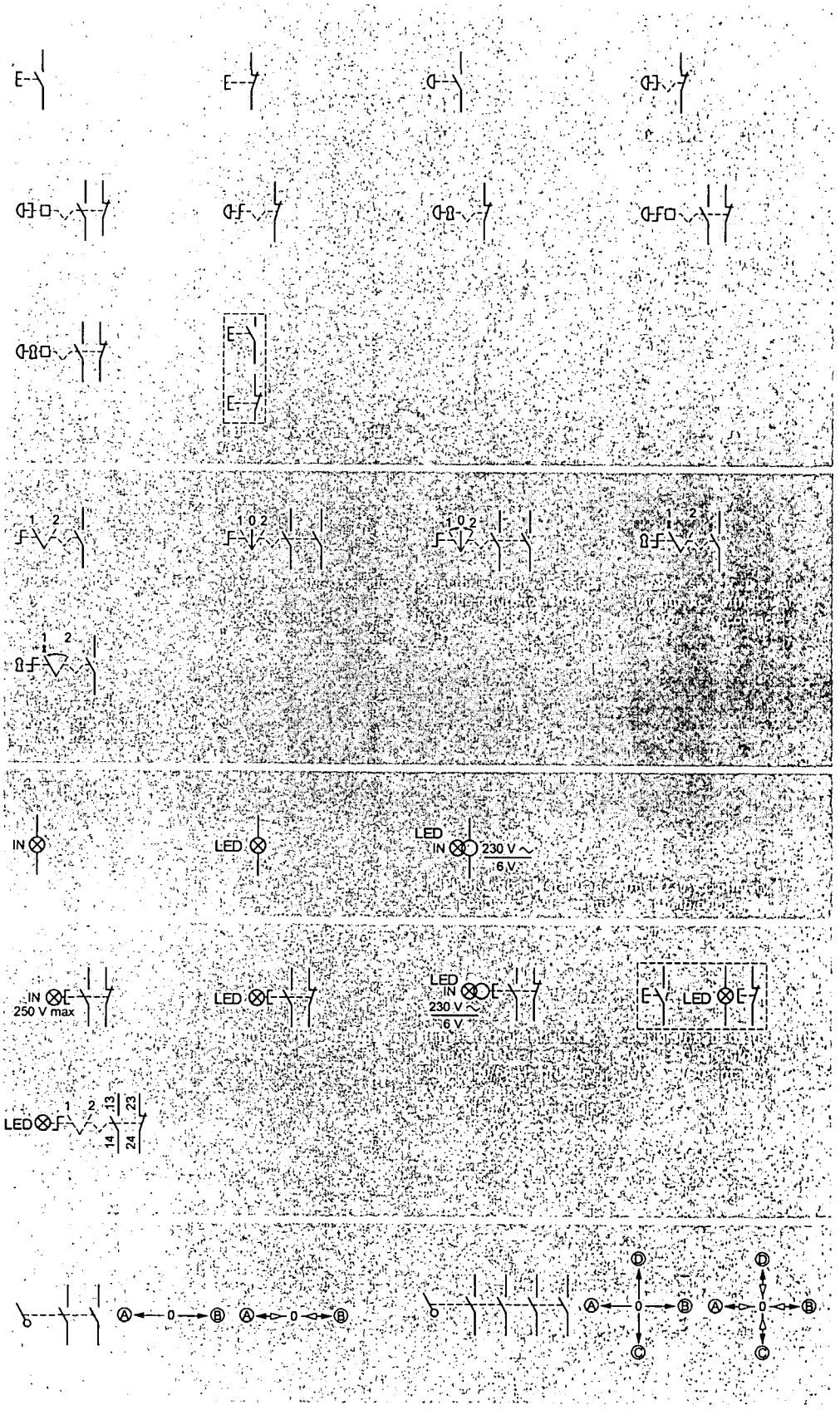
Sub-assemblies for user assembly
ZB5-A

Component parts and accessories
ZB



Control and signalling units Ø 22

Harmony® style 5
Pushbuttons, switches and pilot lights, with double insulated bezel



SJ ELECTRIC

TECHNICAL DATA SHEET

For

Cockle Street Pump Station

Equipment Type:	Phase Failure Relay
Location:	Common Control
Model Numbers:	RM4-TR32
Manufacturer:	Crompton
Supplier:	Schneider Electric. 30 Graystone Street TINGALPA QLD 4173 Ph: 07 3890 2112 Fx: 07 3890 2098

Zelio Control measurement and control relays

3-phase supply control relays model RM4 T

RM4 T

Functions

These devices are designed to monitor 3-phase supplies and to protect motors and other loads against the faults listed in the table below.
They have a transparent, hinged flap on their front face to prevent any accidental alteration of the settings. This flap can be directly sealed.

	RM4 TG	RM4 TU	RM4 TR	RM4 TA
Monitoring of rotational direction of phases				
Detection of complete failure of one or more of the phases				
Undervoltage detection				
Overvoltage and undervoltage detection (2 thresholds)				
Detection of phase asymmetry (imbalance)				

Function performed
Function not performed

Applications

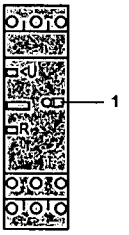
- Control for connection of moving equipment (site equipment, agricultural equipment, refrigerated trucks).
- Control for protection of persons and equipment against the consequences of reverse running (lifting, handling, elevators, escalators, etc.).
- Control of sensitive 3-phase supplies.
- Protection against the risk of a driving load (phase failure).
- Normal/emergency power supply switching.

Presentation

RM4 TG

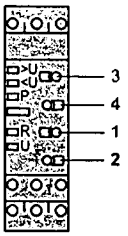
R Yellow LED: indicates relay output state.

RM4 TU

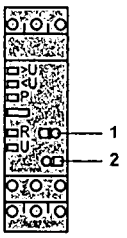


R Yellow LED: indicates relay output state.
< U Red LED: undervoltage fault.
1 Undervoltage setting potentiometer.

RM4 TR31.
RM4 TR32

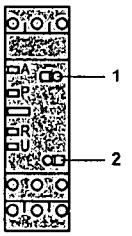


RM4 TR33.
RM4 TR34

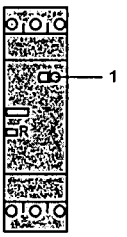


1 Time delay function selector:
Fault detection delayed.
Fault detection extended.
2 Potentiometer for setting time delay in seconds.
3 Potentiometer for setting overvoltage as a direct value.
4 Potentiometer for setting undervoltage as a direct value.
R Yellow LED: indicates relay state.
U Green LED: indicates that supply to the RM4 is on.
> U Red LED: overvoltage fault
< U Red LED: undervoltage fault
P Red LED: phase failure or incorrect rotational direction of phases.

RM4 TA3



RM4 TA0



1 Asymmetry threshold setting potentiometer, from 5 to 15 %
2 Potentiometer for setting time delay, 0.1 to 10 s.
R Yellow LED: indicates relay state.
U Green LED: indicates that supply to the RM4 is on.
A Red LED: phase asymmetry.
P Red LED: phase failure or incorrect rotational direction of phases.

References : page 28473/5
Characteristics : page 28473/6
Dimensions, schemes : page 28473/7

Presentation (continued)

Zelio Control measurement and control relays

3-phase supply control relays model RM4 T

Operating principle

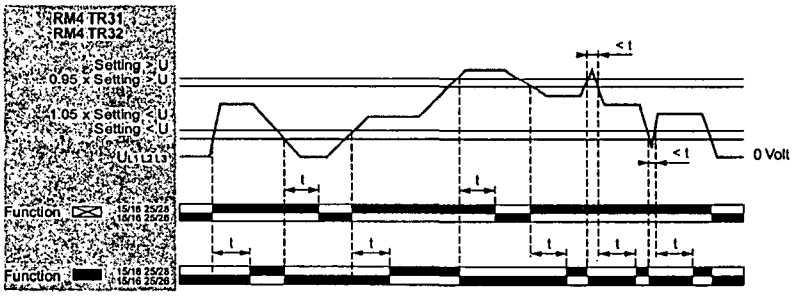
The supply voltage to be monitored is connected to terminals L1, L2, L3 of the product.

There is no need to provide a separate power supply for RM4 T relays; they are self-powered by terminals L1, L2, L3.

- **Monitoring rotational direction of phases and detection of complete failure of one of more of the phases** (RM4 T all models)
  When terminals L1, L2, L3 are energised, the relay is energised and the yellow LED comes on if the rotational direction of phases is correct and if all 3 phases are present.
  If one or more of the phases have failed or if the rotational direction is incorrect, the relay is not energised at switch-on. In normal operation (no fault) the relay is energised; it de-energises instantaneously in the event of failure of one or more of the phases (any time delay set is not active on these faults).
  In the event of failure or absence of a single phase, a voltage greater than the detection threshold (<130 V on RM4 TG, undervoltage threshold setting on RM4 TU and RM4 TR) can be generated back through the control circuit, thus preventing detection of the phase failure. In this case, we recommend the use of RM4 TA relays.
  The absence of a phase is signalled, on RM4 TR and RM4 TA, by illumination of led "P".

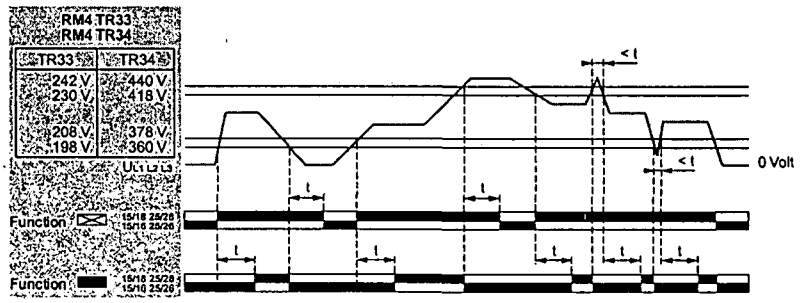
- **Overvoltage and undervoltage detection (RM4 TR):**
  In normal operation, the relay is energised and LEDs "U" and "R" are illuminated.
  If the average of the 3 voltages between phases goes outside the range to be monitored, the output relay is de-energised:
  - **overvoltage**: the Red LED "> U" illuminates.
  - **undervoltage**: the Red LED "< U" illuminates.
  When the supply returns towards its rated value, the relay is re-energised according to the hysteresis value (5%) and the corresponding red LED goes out.
  A selector switch allows selection of an adjustable time delay from 0.1 s to 10 s. With function ⊠ transient "over" or "under" voltages are not taken into account. With function ■ all variations above or below are taken into account and re-energisation of the relay is delayed.
  In all cases, in order to be detected, the duration of the overvoltage or undervoltage must be greater than the measuring cycle time (80 ms).

Function diagram (RM4 TR31, RM4 TR32)



t: time delay

Function diagram (RM4 TR33, RM4 TR34)



t: time delay

References : page 28473/5
Characteristics : page 28473/6
Dimensions, schemes : page 28473/7

Zelio Control measurement and control relays

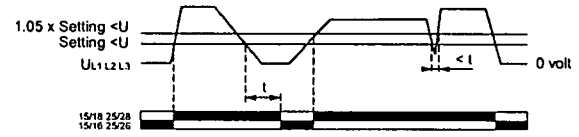
3-phase supply control relays model RM4 T

Operating principle (continued)

- **Undervoltage detection only (RM4 TU)**

In normal operation, the output relay is energised and the yellow LED is illuminated.
If the average of the 3 voltages between phases is less than the undervoltage threshold setting, the relay is de-energised after 550 ms and the red LED "< U" illuminates.

Function diagram

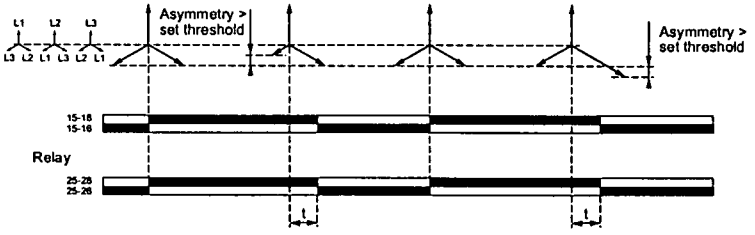


t: fixed time delay = 550 ms

- **Detection of phase asymmetry (RM4 TA)**

In normal operation, the output relay is energised and the yellow and green LEDs are illuminated.
In the event of an asymmetry fault, after a time delay set between 0.1 s and 10 s (on RM4 TA3 only), the output relay is de-energised, the yellow LED goes out and red LED "A" illuminates (RM4 TA3● only).
The relay re-energises when the asymmetry value measured is less than half of the asymmetry value setting (hysteresis).

Function diagram



t: time delay

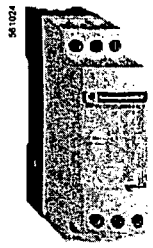
Example: asymmetry set at 10 %, mains supply voltage 400 V

- relay de-energisation threshold: 400 - 10 % = 360 V.
- relay re-energisation threshold: $400\ V - \frac{10\ \%}{2} = 380\ V$.

References : page 28473/5
Characteristics : page 28473/6
Dimensions, schemes : page 28473/7

Zelio Control measurement and control relays

3-phase supply control relays model RM4 T



RM4 TG20

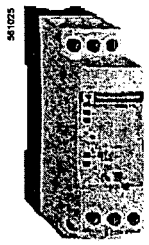
Control relays: rotational direction and presence of phases

Time delay	Rated mains supply voltage (1)		Width	Output relay	Reference	Weight
s	V		mm			kg
None	200...500 50/60 Hz		22.5	2 C/O	RM4 TG20	0.110

Control relays: rotational direction and presence of phases + undervoltage

Time delay	Rated mains supply voltage (1)	Control threshold	Width	Output relay	Reference	Weight
s	V	V	mm			kg
None	200...240 50/60 Hz	Undervoltage 160...220	22.5	2 C/O	RM4 TU01	0.110
	380...500 50/60 Hz	Undervoltage 300...430	22.5	2 C/O	RM4 TU02	0.110

Control relays: rotational direction and presence of phases + overvoltage and undervoltage



RM4 TR33

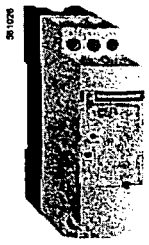
Relays with fixed voltage thresholds

Adjustable time delay	Rated mains supply voltage (1)	Control threshold	Width	Output relay	Reference	Weight
s	V	V	mm			kg
0.1...10	220 50/60 Hz	Undervoltage 198 Overvoltage 242	22.5	2 C/O	RM4 TR33	0.110
	400 50/60 Hz	Undervoltage 360 Overvoltage 440	22.5	2 C/O	RM4 TR34	0.110

Relays with adjustable voltage thresholds

Adjustable time delay	Rated mains supply voltage (1)	Control threshold	Width	Output relay	Reference	Weight
s	V	V	mm			kg
0.1...10	200...240 50/60 Hz	Undervoltage 160...220 Overvoltage 220...300	22.5	2 C/O	RM4 TR31	0.110
	380...500 50/60 Hz	Undervoltage 300...430 Overvoltage 420...580	22.5	2 C/O	RM4 TR32	0.110

Control relays: rotational direction and presence of phases + asymmetry



RM4 TA01

Time delay on de-energisation	Rated mains supply voltage (1)	Control threshold	Width	Output relay	Reference	Weight
s	V	%	mm			kg
Fixed 0.5	200...240 50/60 Hz	Asymmetry 5...15	22.5	1 C/O	RM4 TA01	0.110
	380...500 50/60 Hz	Asymmetry 5...15	22.5	1 C/O	RM4 TA02	0.110
Adjustable 0.1...10	200...240 50/60 Hz	Asymmetry 5...15	22.5	2 C/O	RM4 TA31	0.110
	380...500 50/60 Hz	Asymmetry 5...15	22.5	2 C/O	RM4 TA32	0.110

Can be used on other supply voltages provided that the minimum operational voltages, maximum voltage between phases and compatibility with the control threshold ranges are complied with, see page 28473/5.

Presentation : pages 28473/2 to 28473/4 | Characteristics : page 28473/6 | Dimensions, schemes : page 28473/7

Characteristics

Zelio Control measurement and control relays

3-phase supply control relays model RM4 T

Type of relay			RM4 TG	RM4 TU	RM4 TR	RM4 TA
Output relay and operating characteristics						
Number of C/O contacts			2	2	2	**RM4 TA3i: 2** **RM4 TA0●: 1**
Output relay state			Energised during fault free operation. De-energised or unable to energise on detection of rotational direction fault or failure of one or more phases	Energised during fault free operation. De-energised on detection of undervoltage or rotational direction fault or failure of one or more phases	Energised during fault free operation. De-energised on detection of overvoltage, undervoltage or rotational direction fault or phase failure	Energised during fault free operation. De-energised on detection of asymmetry fault, phase failure or rotational direction fault
Accuracy of switching threshold setting	As % of the set value		–	± 3 %	± 3 %	± 3 %
Switching threshold drift	Depending on the permissible ambient temperature		–	≤ 0.06 % per degree centigrade	≤ 0.06 % per degree centigrade	≤ 0.06 % per degree centigrade
	Within the measuring range		–	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %
Accuracy of time delay setting	As % of the full scale value		–	± 10 %	± 10 %	± 10 %
Time delay drift	Within the measuring range		–	≤ 0.5 %	≤ 0.5 %	≤ 0.5 %
	Depending on the rated operational temperature		–	≤ 0.07 % per degree centigrade	≤ 0.07 % per degree centigrade	≤ 0.07 % per degree centigrade
Hysteresis	Fixed		–	About 5 % of the de-energisation threshold	About 5 % of the de-energisation threshold	About 50 % of the asymmetry percentage
Measuring cycle		ms	≤ 80	≤ 80	≤ 80	≤ 80
Measuring input characteristics						
Minimum operational voltage (1)	L1 L2 or L2 L3 or L1 L3	V	140	**RM4 TU01:** 160 **RM4 TU02:** 290	**RM4 TR31, RM4 TR33:** 160 **RM4 TR32, RM4 TR34:** 290	**RM4 TA01, RM4 TA31:** 160 **RM4 TA02, RM4 TA32:** 290
Maximum permissible voltage between phases	L1 L2 L3	V	580	**RM4 TU01:** 300 **RM4 TU02:** 580	**RM4 TR31, RM4 TR33:** 300 **RM4 TR32, RM4 TR34:** 580	**RM4 TA01, RM4 TA31:** 300 **RM4 TA02, RM4 TA32:** 580

(1) Minimum voltage required for operation of indicators and of the time delay.

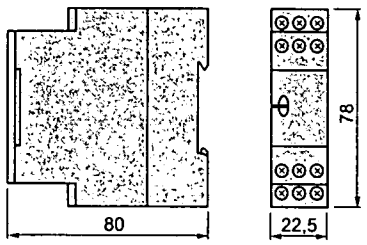
Presentation : pages 28473/2 to 28473/4 | References : page 28473/5 | Dimensions, schemes : page 28473/7

Dimensions, Schemes

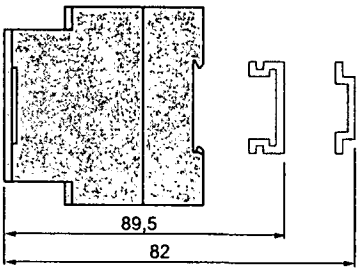
Zelio Control measurement and control relays

3-phase supply control relays model RM4 T

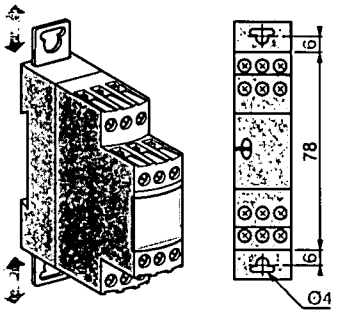
Dimensions
RM4 T



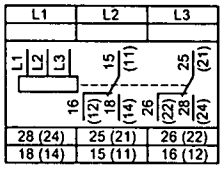
Rail mounting



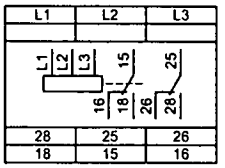
Screw fixing



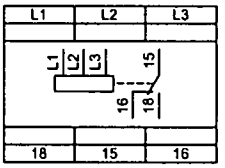
Schemes, connection
Terminal blocks
RM4 TG20, TU0i



RM4 TR3●, TA3●



RM4 TA0●

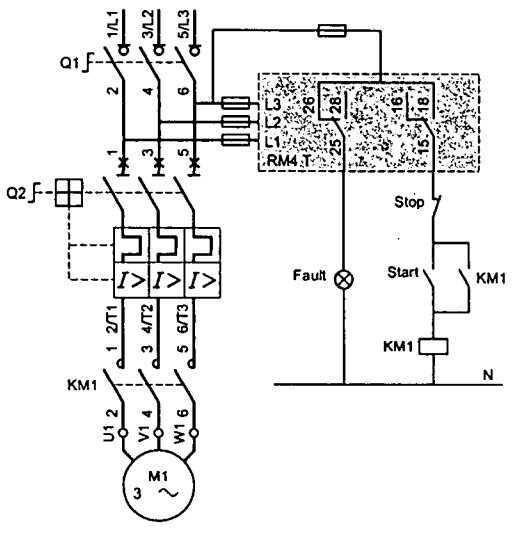


L1, L2, L3	Supply to be monitored
15(11)-18(14)	1st C/O contact
15(11)-16(12)	of the output relay
25(21)-28(24)	2nd C/O contact
25(21)-26(22)	of the output relay

L1, L2, L3	Supply to be monitored
15-18	1st C/O contact
15-16	of the output relay
25-28	2nd C/O contact
25-26	of the output relay

L1, L2, L3	Supply to be monitored
15-18	1st C/O contact
15-16	of the output relay

Application scheme
Example



Presentation : pages 28473/2 to 28473/4
References : page 28473/5
Characteristics : page 28473/6

Zelio Control measurement and control relays

Environment

Conforming to standards			IEC 60255-6, EN 60255-6
Product approvals			CSA, GL, UL, pending
CE marking			Zelio Control measurement relays conform to European regulations relating to CE marking
Ambient air temperature around the device	Storage	°C	- 40...+ 85
	Operation	°C	- 20...+ 65
Permissible relative humidity range	Conforming to IEC 60721-3-3		15...85 % Environmental class 3K3
Vibration resistance	Conforming to IEC 6068-2-6, 10 to 55 Hz		a = 0.35 ms
Shock resistance	Conforming to IEC 6068-2-27		15 gn - 11 ms
Degree of protection	Casing		IP 50
	Terminals		IP 20
Degree of pollution	Conforming to IEC 60664-1		3
Overvoltage category	Conforming to IEC 60664-1		III
Rated insulation voltage	Conforming to IEC	V	500
	Conforming to CSA	V	(1)
Test voltage for insulation tests	Dielectric test	kV	2.5
	Shock wave	kV	4.8
Voltage limits	Power supply circuit		0.85...1.1 Uc (2)
Frequency limits	Power supply circuit		50/60 ± 5 %
Disconnection value	Power supply circuit		> 0.1 Uc (2)
Mounting position without derating	In relation to normal vertical mounting plane		Any position
Connection Maximum c.s.a.	Flexible cable without cable end	mm^2	2 x 2.5
	Flexible cable with cable end	mm^2	2 x 1.5
Tightening torque		N.m	0.6...1.1

Immunity to electromagnetic interference (EMC) (Application class 2 conforming to EN 61812-1)

Electrostatic discharge	Conforming to IEC 61000-4-2		Level 3 (6 kV contact, 8 kV air)
Electromagnetic fields	Conforming to IEC 61000-4-3		Level 3 (10 V/m)
Fast transients	Conforming to IEC 61000-4-4		Level 3 (2 kV)
Shock waves	Conforming to IEC 61000-4-5		Level 3 (2 kV)
Radiated and conducted emissions	CISPR11		Group 1 class A
	CISPR22		Class A

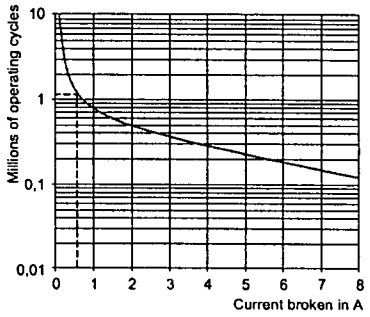
(1) Value not communicated.
(2) Except RM4-T, see page 28473/5.

Zelio Control measurement and control relays

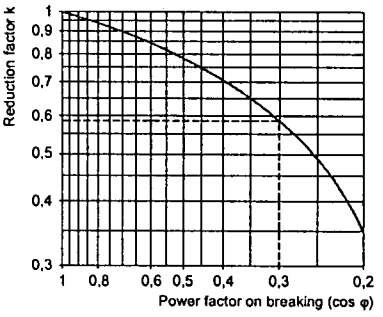
Output circuit characteristics

Mechanical durability	In millions of operating cycles		30		
Current limit Ith		A	8		
Rated operational limits at 70 °C Conforming to IEC 60947-5-1/1991 and VDE 0660			24 V	115 V	250 V
	AC-15	A	3	3	3
	DC-13	A	2	0.3	0.1
Minimum switching capacity			12 V/10 mA		
Switching voltage	Rated	V	~ 250		
	Max	V	~ 440		
Contact material			Nickel Silver 90/10		

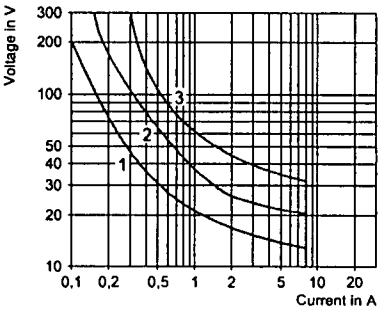
a.c. load
Curve 1
Electrical durability of the contacts on a resistive load in millions of operating cycles



Curve 2
Reduction factor k for inductive loads (applies to values taken from the durability curve opposite)



d.c. load
Load limit curve

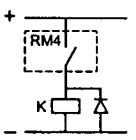


Example:

An LC1-F185 contactor supplied with 115 V/50 Hz for a consumption of 55 VA or a current consumption equal to 0.1 A and cos φ = 0.3
For 0.1 A, curve 1 indicates durability of approximately 1.5 million operating cycles.
As the load is inductive, it is necessary to apply a reduction coefficient k to this number of cycles, as indicated by curve 2.

For cos φ = 0.3 : k = 0.6
The electrical durability therefore becomes:
1.5 106 operating cycles x 0.6 = 900 000 operating cycles

1 L/R = 20 ms
2 L/R with load protection diode
3 Resistive load



SJ ELECTRIC

TECHNICAL DATA SHEET

For

Cockle Street Pump Station

Equipment Type:	Current Transducer
Location:	Pump Control
Model Numbers:	D414-5A 24vdc
Manufacturer:	Crompton
Supplier:	Alstrom. 3/7 Miller Street Murrarie QLD 4172 Ph: 07 3890 4412 Fx: 07 3890 4413

tyco / Electronics / Energy Division **INSTALLATION INSTRUCTIONS**

Ref: IW250TX253 – Rev 6 – Sept 02

Products Covered

253-TAA	253-TRR	253-TAL	253-TRT
253-TAM	253-TVA	253-TAN	253-TVL
253-TAP	253-TVR	253-THZ	253-TVZ
253-TDN	253-TAR	253-TDM	253-TDP
253-TRP			

Paladin Transducers
Class 0.5 250 Series
Current, Voltage, Frequency, Resistance & Integrating Demand

Introduction
Paladin Transducers give a dc output proportional to the input. Zero and span adjustments are accessible without opening the transducer. The cases are moulded in a tough flame-retardant material.

Installation
The Transducer should be installed in a dry position, not in direct sunlight and where the ambient temperature is reasonably stable and will not be outside the range 0 to 60 degrees Celsius. Mounting will normally be on a vertical surface but other positions will not affect the operation and vibration should be kept to a minimum. The Transducers are designed for mounting on a 35mm rail to DIN 46277. Alternatively they may be screw fixed.

To mount a Transducer on a DIN rail, the top edge of the cut-out on the back is hooked over one edge of the rail and bottom edge carrying the release clip clicked into place. Check that the unit is firmly fixed. Removal or repositioning may be achieved by levering down the release clip and lifting the unit up and off the rail.

Connection diagrams should be carefully followed to ensure correct polarity and phase rotation where applicable. External voltage transformers may be used to extend the range. Connection wires should be sized to comply with applicable regulations and codes of practice. These products do not have internal fuses therefore external fuses **must** be used for safety protection under fault conditions.

Earth/Ground Connections
For safety reasons, CT secondary connections should be grounded according to local codes of practice.
Side labels show full connection information and data.

Commissioning
The units are calibrated at the factory for full accuracy. No further adjustments are required. Zero and span adjustment where provided are under the bungs on the front panel. Resetting these will degrade the accuracy of this transducer, but may be used to compensate for system errors etc. typically 10% of the span of the control concerned.

Fusing and connections
1. This unit must be fitted with external fuses in voltage and auxiliary supply lines.
2. Voltage input lines must be fused with a quick blow fuse 1A maximum.
3. Auxiliary supply lines must be fused with a slow blow fuse rated 1A maximum.
4. Choose fuses of a type and with a breaking capacity appropriate to the supply and in accordance with local regulations.
5. Where fitted, CT secondaries must be grounded in accordance with local regulations.

Electromagnetic Compatibility
This unit has been designed to provide protection against EM (electro-magnetic) interference in line with requirements of EU and other regulations. Precautions necessary to provide proper operation of this and adjacent equipment will be installation dependent and so the following can only be general guidance:-

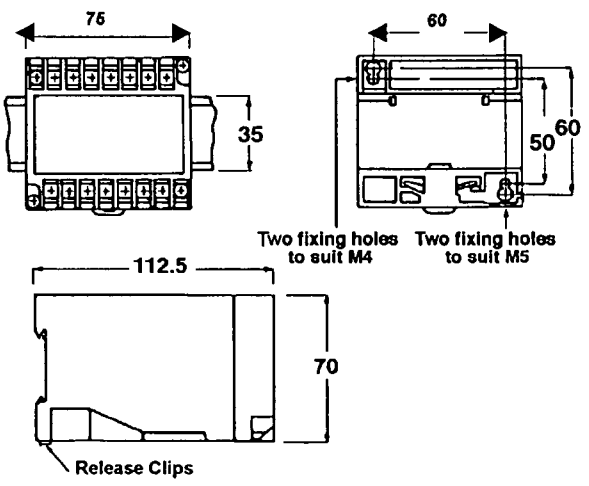
- Avoid routing wiring to this unit alongside cables and products that are, or could be, a source of interference.
- The auxiliary supply to the unit should not be subject to excessive interference. In some cases, a supply line filter may be required.
- To protect the product against incorrect operation or permanent damage, surge transients must be controlled. It is good EMC practice to suppress differential surges to 2kV or less at the source. The unit has been designed to automatically recover from typical transients, however in extreme circumstances it may be necessary to temporarily disconnect the auxiliary supply for a period of greater than 5 seconds to restore correct operation.
- Screened communication and small signal leads are recommended and may be required. These and other connecting leads may require the fitting of RF suppression components, such as ferrite absorbers, line filters etc., if RF fields cause problems.
  It is good practice to install sensitive electronic instruments that are performing critical functions in EMC enclosures that protect against electrical interference causing a disturbance in function.

For assistance on protection requirements please contact your local sales office.

Low Voltage Directive:- This product complies with BS EN 61010-1.

Warning
- During normal operation, voltages hazardous to life may be present at some of the terminals of this unit. Installation and servicing should be performed only by qualified, properly trained personnel' abiding by local regulations. Ensure all supplies are de-energised before attempting connection or other procedures.
- It is recommended adjustments be made with the supplies de-energised, but if this is not possible, then extreme caution should be exercised.
- Terminals should not be user accessible after installation and external installation provisions must be sufficient to prevent hazards under fault conditions.
- This unit is not intended to function as part of a system providing the sole means of fault protection - good engineering practice dictates that any critical function be protected by at least two independent and diverse means.
- Never open circuit the secondary winding of an energised current transformer.

Dimensions



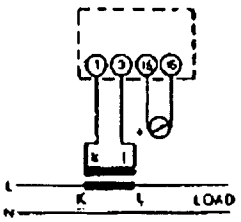
Crompton INSTRUMENTS

Ref: IW250TX253– Rev 6 – Sept 02

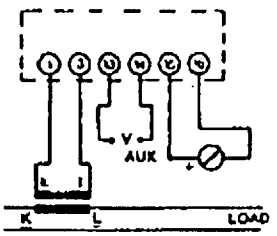
INSTALLATION INSTRUCTIONS

Paladin Transducers
Class 0.5 250 Series

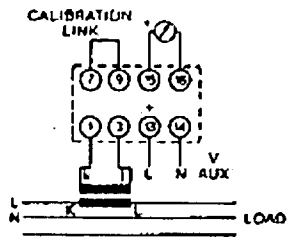
253-TAA
Current Average
Sensing



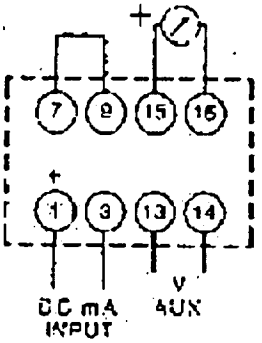
253-TAL
Live Zero Current
253-TAR
RMS Current



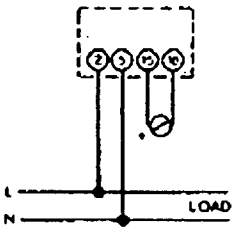
253-TAM
253-TAN
253-TAP
Integrating AC
Current



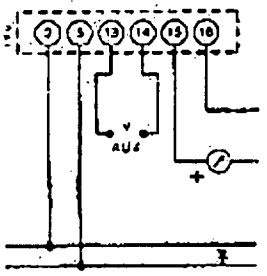
253-TDP
253-TDM
253-TDN
Integrating DC
Current



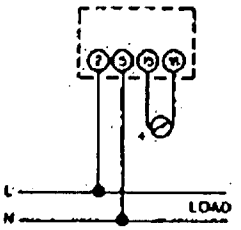
253-TVA
Voltage Average
Sensing



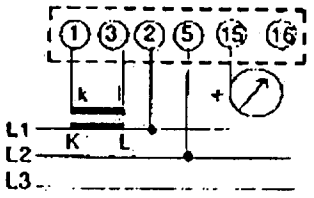
253-TVL
Live Zero Voltage
253-TVR
RMS Voltage



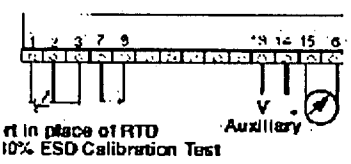
253-TVZ
Suppressed Zero
Voltage
253-THZ
Frequency



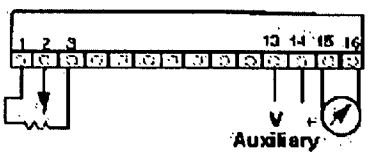
256-TWS
3 Phase 3 Wire
Balanced Load



253-TRR
Temperature
Transmitter



253-TRP/TRT
Tap Position &
Slidewire
Transmitter



Tyco Electronics UK Limited
Crompton Instruments
Freebournes Road, Witham, Essex, CM8 3AH, UK
Phone: +44 1376 509 509 Fax: +44 1376 509 511 **http://energy.tycoelectronics.com**

Brisbane City

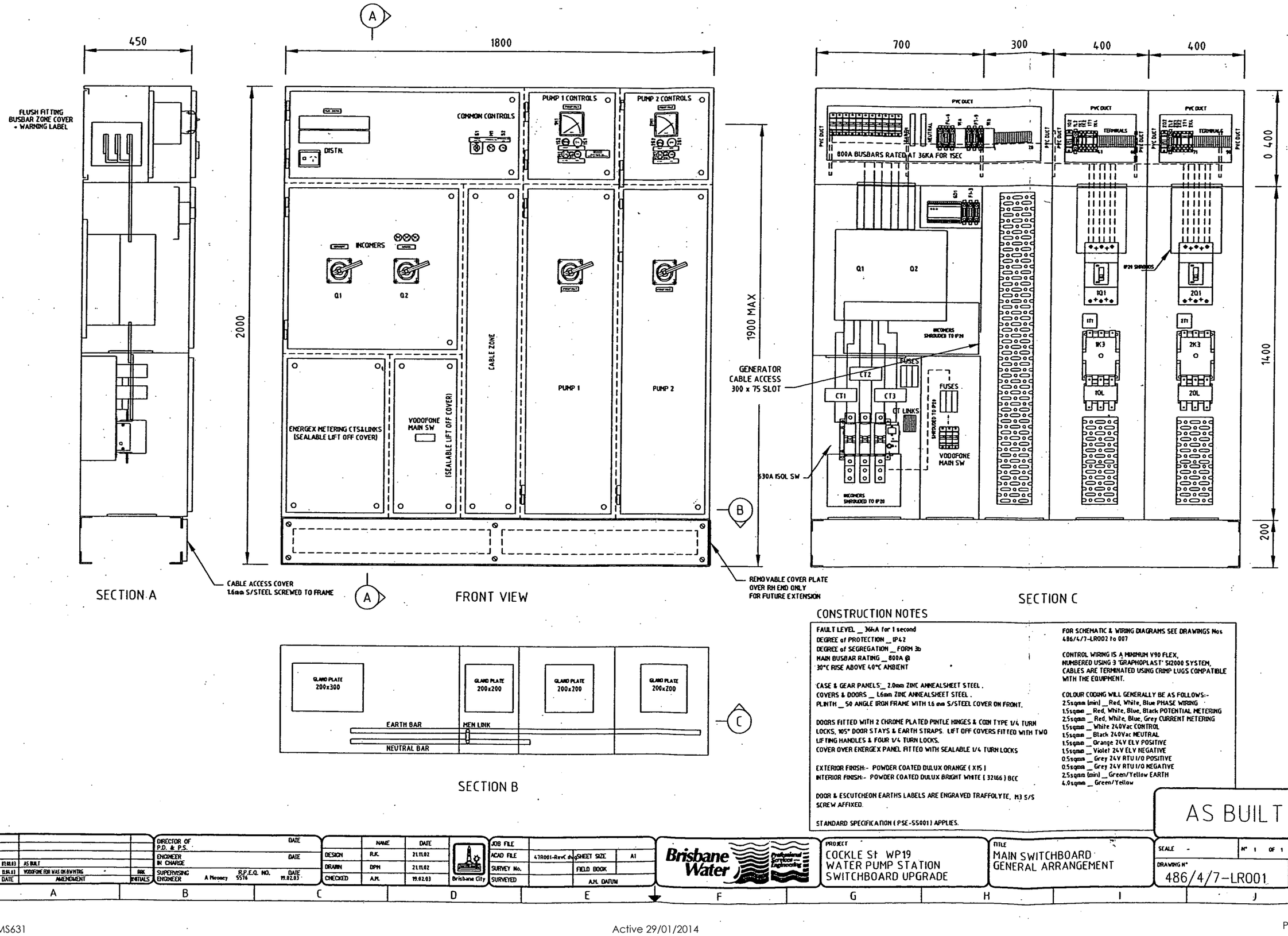
Brisbane Water

COCKLE STREET WATER PUMP STATION WP19 SWITCHBOARD UPGRADE ELECTRICAL DRAWINGS

ELECTRICAL DRAWING LIST

DWG N°.	TITLE
486/4/7-LR000	DRAWING INDEX
486/4/7-LR001	SWITCHBOARD GENERAL ARRANGEMENT
486/4/7-LR002	SINGLE LINE DIAGRAM
486/4/7-LR003	INCOMERS SCHEMATIC
486/4/7-LR004	INCOMERS & COMMON CONTROLS SCHEMATIC
486/4/7-LR005	PUMP No.1 SCHEMATIC
486/4/7-LR006	PUMP No.2 SCHEMATIC
486/4/7-LR007	CONTROL TERMINATIONS DIAGRAM
486/4/7-LR008	AREA LAYOUT
486/4/7-LR009	GENERATOR TERMINAL BOX DETAILS

CADD FILE 47LR000.dwg	SUPERVISING ENGINEER	
JOB FILE	N° 1 OF 1	SHEETS
DRAWING N° 486/4/7-LR000		AMEND. 0



CONSTRUCTION NOTES

FAULT LEVEL _ 36kA for 1 second
DEGREE of PROTECTION _ IP42
DEGREE of SEGREGATION _ FORM 3b
MAIN BUSBAR RATING _ 800A @
30°C RISE ABOVE 40°C AMBIENT

CASE & GEAR PANELS _ 2.0mm ZINC ANNEALSHEET STEEL.
COVERS & DOORS _ 1.6mm ZINC ANNEALSHEET STEEL.
PLINTH _ 50 ANGLE IRON FRAME WITH 1.6 mm S/STEEL COVER ON FRONT.

DOORS FITTED WITH 2 CHROME PLATED PINTLE HINGES & COIN TYPE 1/4 TURN LOCKS, 105° DOOR STAYS & EARTH STRAPS. LIFT OFF COVERS FITTED WITH TWO LIFTING HANDLES & FOUR 1/4 TURN LOCKS.
COVER OVER ENERGEX PANEL FITTED WITH SEALABLE 1/4 TURN LOCKS

EXTERIOR FINISH:- POWDER COATED DULUX ORANGE (X15)
INTERIOR FINISH:- POWDER COATED DULUX BRIGHT WHITE (32166) BCC

DOOR & ESCUTCHEON EARTHS LABELS ARE ENGRAVED TRAFFOLYTE, M3 S/S SCREW AFFIXED.

STANDARD SPECIFICATION (PSE-SS001) APPLIES.

FOR SCHEMATIC & WIRING DIAGRAMS SEE DRAWINGS Nos 486/4/7-LR002 to 007

CONTROL WIRING IS A MINIMUM V90 FLEX, NUMBERED USING 3 'GRAPHOPLAST' SI2000 SYSTEM, CABLES ARE TERMINATED USING CRIMP LUGS COMPATIBLE WITH THE EQUIPMENT.

COLOUR CODING WILL GENERALLY BE AS FOLLOWS:-
2.5sqmm (min) _ Red, White, Blue PHASE WIRING
1.5sqmm _ Red, White, Blue, Black POTENTIAL METERING
2.5sqmm _ Red, White, Blue, Grey CURRENT METERING
1.5sqmm _ White 240Vac CONTROL
1.5sqmm _ Black 240Vac NEUTRAL
1.5sqmm _ Orange 24V ELV POSITIVE
1.5sqmm _ Violet 24V ELV NEGATIVE
0.5sqmm _ Grey 24V RTU I/O POSITIVE
0.5sqmm _ Grey 24V RTU I/O NEGATIVE
2.5sqmm (min) _ Green/Yellow EARTH
4.0sqmm _ Green/Yellow

AS BUILT

NO.	DATE	AMENDMENT	INITIALS
C	17.06.03	AS BUILT	
B	11.04.03	VODOFONE FOR WAS ON BWNTRG	RJK

DIRECTOR OF P.D. & P.S. _ DATE
ENGINEER IN CHARGE _ DATE
SUPERVISING ENGINEER A Mooney R.P.E.Q. NO. 5576 DATE 19.02.03

	NAME	DATE
DESIGN	R.J.K.	21.11.02
DRAWN	D.P.H.	21.11.02
CHECKED	A.M.	19.02.03

Brisbane City

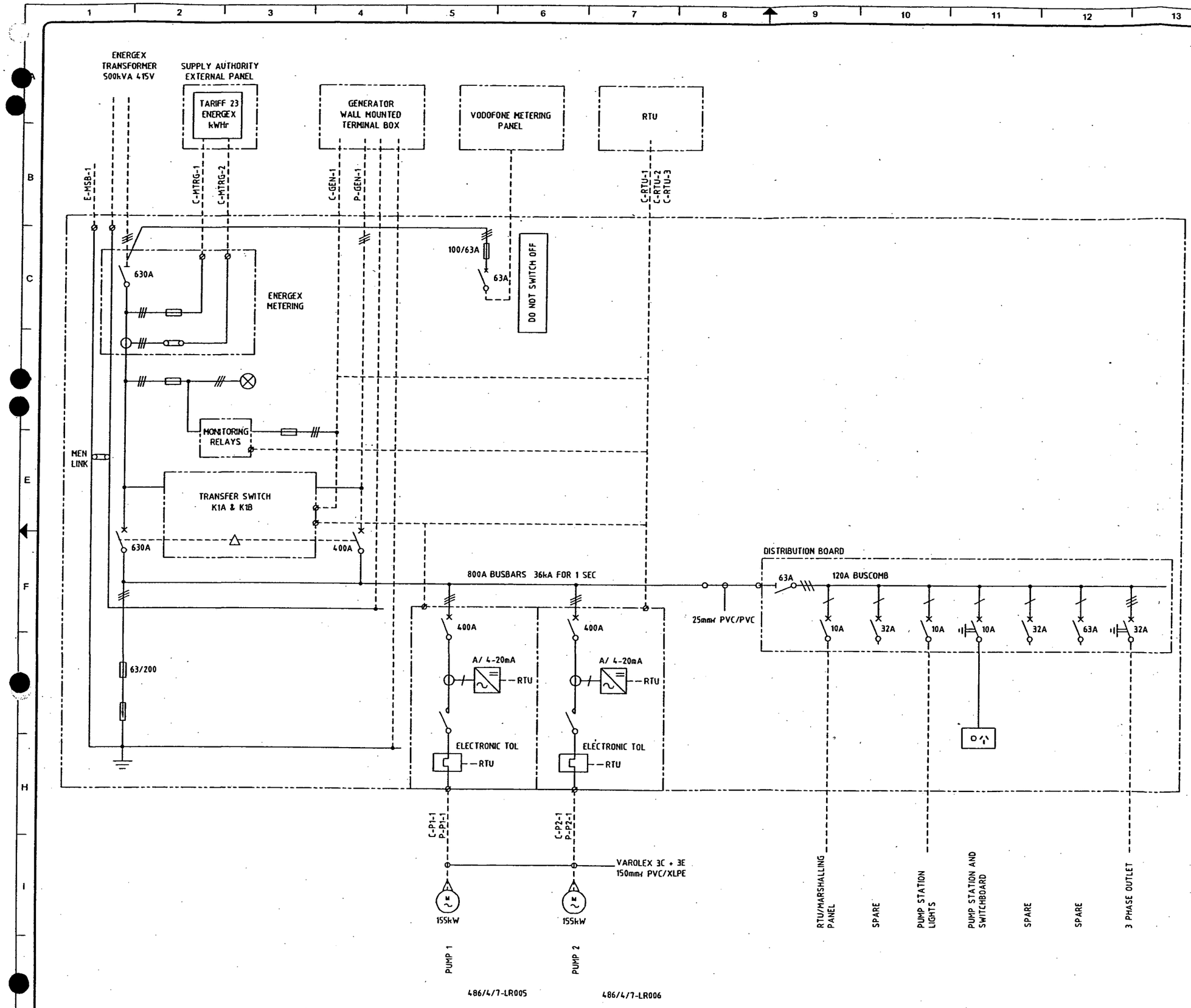
JOB FILE
ACAD FILE 47R001-RevC.dwg SHEET SIZE A1
SURVEY No. FIELD BOOK
SURVEYED A.H. DATUM

Brisbane Water — Professional Services Engineering

PROJECT
COCKLE St WP19
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
GENERAL ARRANGEMENT

SCALE - | N° 1 OF 1 SHEETS
DRAWING N° 486/4/7-LR001 | AMEND. C



AS BUILT

No	DATE	AMENDMENT	INITIALS
B	02.08.03	AS BUILT	
A	11.04.03	VODOFONE FDR WAS ON BW MTRG	RRK

MANAGER OF URBAN MANAGEMENT	DATE
MANAGER OF BUSINESS ASSET SERVICES	DATE
MANAGER PROFESSIONAL SERVICES - ENGINEERING	DATE
SUPERVISING ENGINEER	R.P.E.Q. NO. A Mooney 5596 DATE 2/03
JOB FILE	CAD FILE 47LR002-RevB.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK	AJM	02/03
DRAWN	DPM	21.11.02
DRAFTING CHECK	R.K.	01/03

Brisbane City

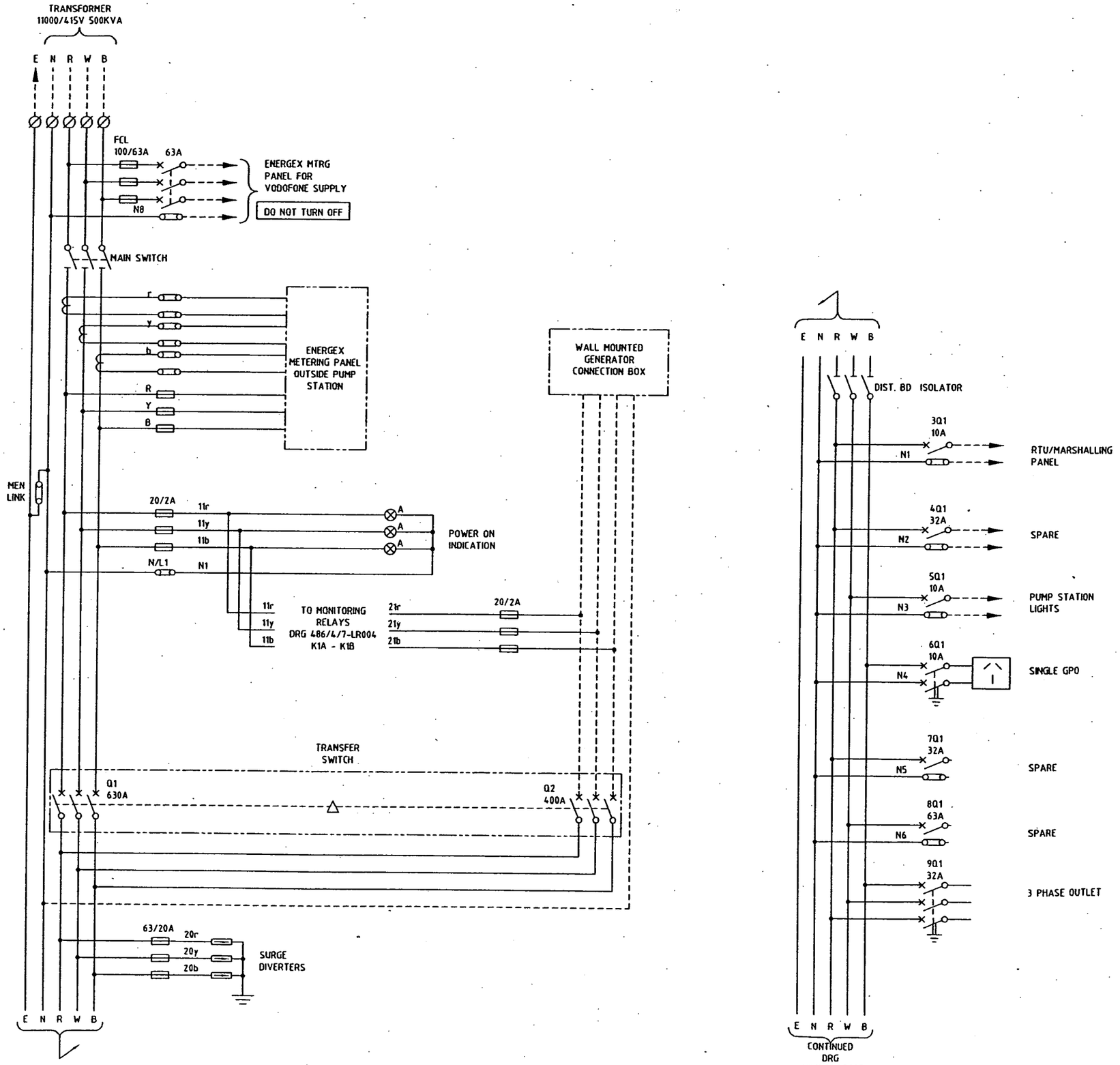
Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP19
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
SINGLE LINE DIAGRAM

SCALE -	A.H. DATUM
	N° 1 OF 1 SHEETS

DRAWING N°	AMEND.
486/4/7-LR002	B



AS BUILT

No	DATE	AMENDMENT	INITIALS
B	06.06.2003	AS BUILT	
A	11.04.03	VODOFONE FDR WAS ON BW MTRG	RRK

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Money 5596 — DATE 2/03

JOB FILE — CAD FILE 47LR003-RevB.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK	AJM	02/03
DRAWN	DPM	21.11.02
DRAFTING CHECK	R.K.	01/03

Brisbane City

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP19
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
INCOMERS
SCHEMATIC DIAGRAM

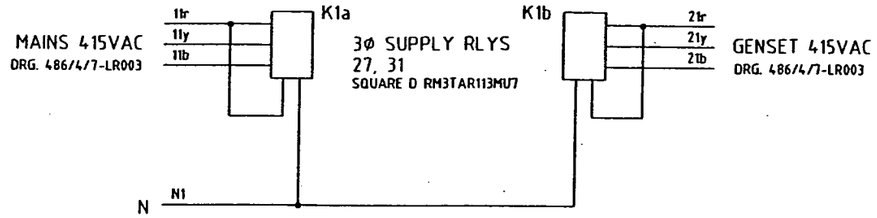
SCALE -

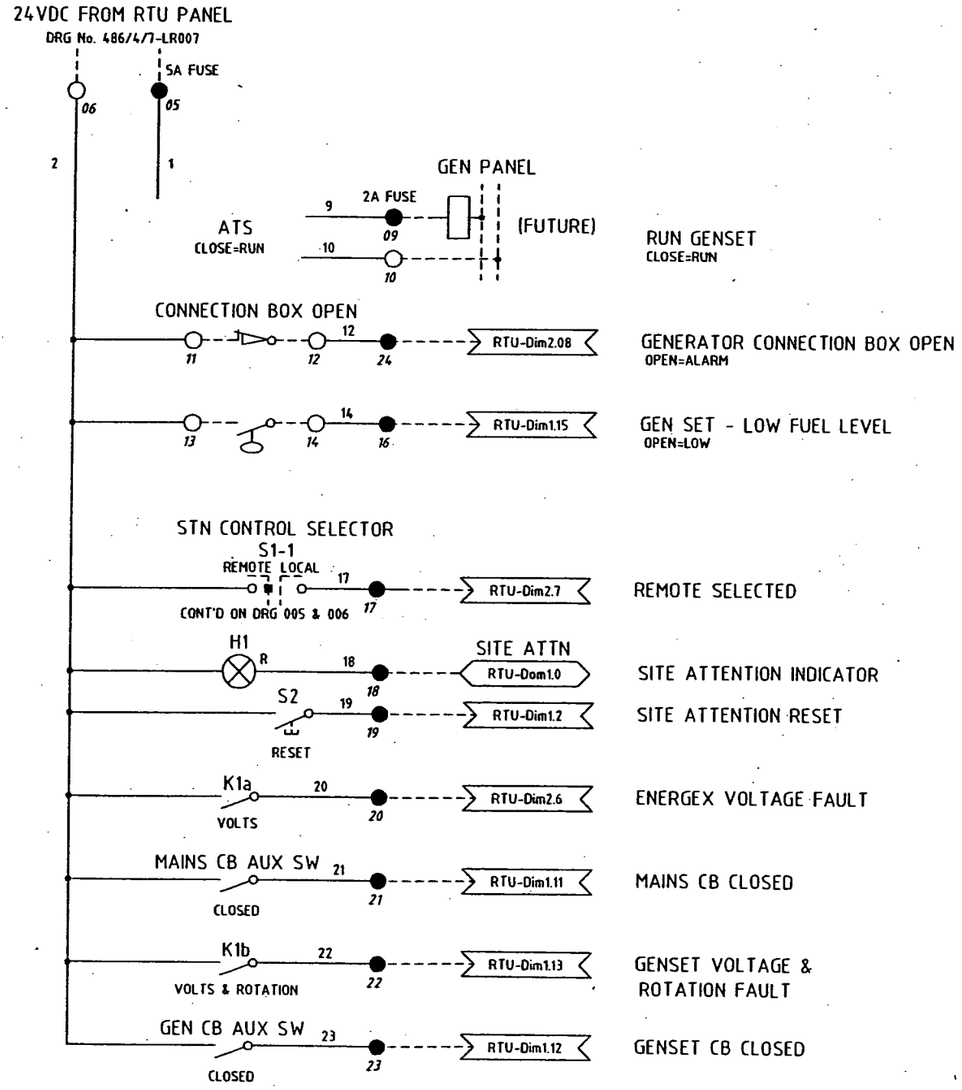
A.H. DATUM

N° 1 OF 1 SHEETS

DRAWING N°
486/4/7-LR003

AMEND.
B





SYMBOLS LEGEND

- ???-?I??? = INPUT
- ???-?O??? = OUTPUT
  - = I/O ADDRESS
  - A=ANALOG, D=DIGITAL
  - RTU=REMOTE TERMINATION UNIT, PCR=PROGRAMABLE CONTROL RELAY
- [P1-XX] = EXTERNAL WIRING
- ● = FUSED TERMINALS (0.1A U.N.O.)
- ○ = LINK TERMINALS

AS BUILT

No	DATE	AMENDMENT	INITIALS
B	05.08.03	AS BUILT	
A	11.04.03	ISSUED FOR CONSTRUCTION	RRK

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Money 5596 — DATE 2/03

JOB FILE — CAD FILE 47LR004-RevB.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK	AJM	02/03
DRAWN	DPM	21.11.02
DRAFTING CHECK	R.K.	01/03

Brisbane City

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP19
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
INCOMERS & COMMON CONTROLS
SCHEMATIC DIAGRAM

SCALE -

A.H. DATUM

N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR004

AMEND. B

CONTINUED FROM 486/4/7-LR003

E N R W B

(PADLOCKABLE)

1Q1

400A

1T1

1K3

10/L 25, 34

PUMP 1
155kW
FLC 267A

0-400A

54+ 55 A 53

53 55

RTU-Aim2.6

MOTOR CURRENT
4 - 20mA

1Q2
2A

1K3-1

59

MOTOR HEATER

101r

1K1

CONTROL SUPPLY OK RELAY
29

STOP PUSHBUTTON
1S1-1

102r

1K2-1

103r

1K3

RUN CONTACTOR
3,4,5, 20, 31

1L2

N102

41

5Amps

47

24VDC FROM RTU PANEL
ORG No. 486/4/7-LR007

42

42

24VDC5A SUPPLY

1K4

43

CLOSED=NO FLOW
REFLUX VALVE POSITION

44

44

FLOW OK RELAY
23, 33

1T1

1K2-2 47A 1K4-1 47E

S1-2
REMOTE LOCAL

START
1S2

1T1-1

FLOW FAIL TIMER
25

10L-1 47D 47C 47B

1S1-2
30

STN CONTROL SELECTOR

OPENS ON DELAY

1K2

RUN PUMP

RTU-Dom1.5 — 47 — 47

RUN RELAY
14, 23
CONTROL SUPPLY OK

RTU-Dim2.9 — 45 — 1K1-1 — 45

SWBD LOCKOUT STOP PB

RTU-Dim2.14 — 46 — 1S1-3 — 46

RUN CONTACTOR ON

RTU-Dim2.8 — 48 — 1K3-2 — 48

1H1 R

STATUS

RTU-Dom1.6 — 49 — 49

REFLUX VALVE OPEN

RTU-Dim2.10 — 50 — 1K4-2 — 50

MOTOR OVERLOAD TRIP

RTU-Dim2.11 — 51 — 10L-2 — 51

FAULT RESET

RTU-Dim2.13 — 52 — 1S3 — 52

RESET

E N R W B

CONTINUED ON
486/4/7-LR006

SYMBOLS LEGEND

???-?I??? = INPUT

???-?O??? = OUTPUT

= I/O ADDRESS

A=ANALOG, D=DIGITAL

RTU=REMOTE TERMINATION UNIT, PCR=PROGRAMABLE CONTROL RELAY

CP1-XX = EXTERNAL WIRING

● = FUSED TERMINALS (0.1A U.N.O.)

○ = LINK TERMINALS

⊠ = FIELD TERMINALS

Ø = STARTER TERMINALS

AS BUILT

No	DATE	AMENDMENT	INITIALS
B	05.08.03	AS BUILT	
A	11.04.03	ISSUED FOR CONSTRUCTION	DPM

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Money 5596 — DATE 2/03

JOB FILE — CAD FILE 47LR005-RevB.dwg

DESIGN	R.R.K.	21.11.02
DESIGN CHECK	A.M.	02/03
DRAWN	RRK	21.11.02
DRAFTING CHECK	R.R.K.	01/03

Brisbane City

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP19
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
PUMP No.1
SCHEMATIC DIAGRAM

SCALE -

A.H. DATUM

N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR005

AMEND. B

CONTINUED FROM 486/4/7-LR003

E N R W B

(PADLOCKABLE)

2Q1

400A

2T1

2K3

20/L 25, 34

PUMP 2
155kW
FLC 267A

0-400A

84
85
A
83
83
85

RTU-Aim2.7

MOTOR CURRENT
4 - 20mA

2Q2
2A

2K3-1
59

MOTOR HEATER

101r

2K1

CONTROL SUPPLY OK RELAY
29

STOP PUSHBUTTON
2S1-1

102r

2K2-1

103r
2K3

RUN CONTACTOR
3,4,5, 20, 31

2L2

N102

71
5Amps
71

24VDC FROM RTU PANEL
DRG No. 486/4/7-LR007

72
72

24VDC5A SUPPLY

73
74
74

CLOSED=NO FLOW
REFLUX VALVE POSITION

2K4

FLOW OK RELAY
23, 33

2K2-2
77A
2K4-1
77E

2T1

FLOW FAIL TIMER
25

S1-3
REMOTE
LOCAL

START
2S2

2T1-1

20L-1
77D
2S1-2
30
77C
77B

STN CONTROL SELECTOR

OPENS ON DELAY

RUN PUMP

RTU-Dom1.7
77
77

2K2

RUN RELAY
14, 23

RTU-Dim3.9
75
75

2K1-1

CONTROL SUPPLY OK

RTU-Dim3.14
76
76

2S1-3

SWBD LOCKOUT STOP PB

RTU-Dim3.8
78
78

2K3-2

RUN CONTACTOR ON

RTU-Dom1.8
79
79

2H1
R

STATUS

RTU-Dim3.10
80
80

2K4-2

REFLUX VALVE OPEN

RTU-Dim3.11
81
81

20L-2

MOTOR OVERLOAD TRIP

RTU-Dim3.12
82
82

2S3
RESET

FAULT RESET

E N R W B

CONTINUED ON 486/4/7-LR006

SYMBOLS LEGEND

???-?I??? = INPUT

???-?O??? = OUTPUT

= I/O ADDRESS

A=ANALOG, D=DIGITAL

RTU=REMOTE TERMINATION UNIT, PCR=PROGRAMABLE CONTROL RELAY

CP1-XX = EXTERNAL WIRING

= FUSED TERMINALS (0.1A U.N.O.)

= LINK TERMINALS

= FIELD TERMINALS

= STARTER TERMINALS

AS BUILT

No	DATE	AMENDMENT	INITIALS
B	05.08.03	AS BUILT	
A	11.04.03	ISSUED FOR CONSTRUCTION	RRK

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Money 5596 — DATE 2/03

JOB FILE — CAD FILE 47LR006-RevB.dwg

DESIGN	R.R.K.	21.11.02
DESIGN CHECK	A.M.	02/03
DRAWN	DPM	21.11.02
DRAFTING CHECK	R.R.K.	01/03

Brisbane City

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP19
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
PUMP No.2
SCHEMATIC DIAGRAM

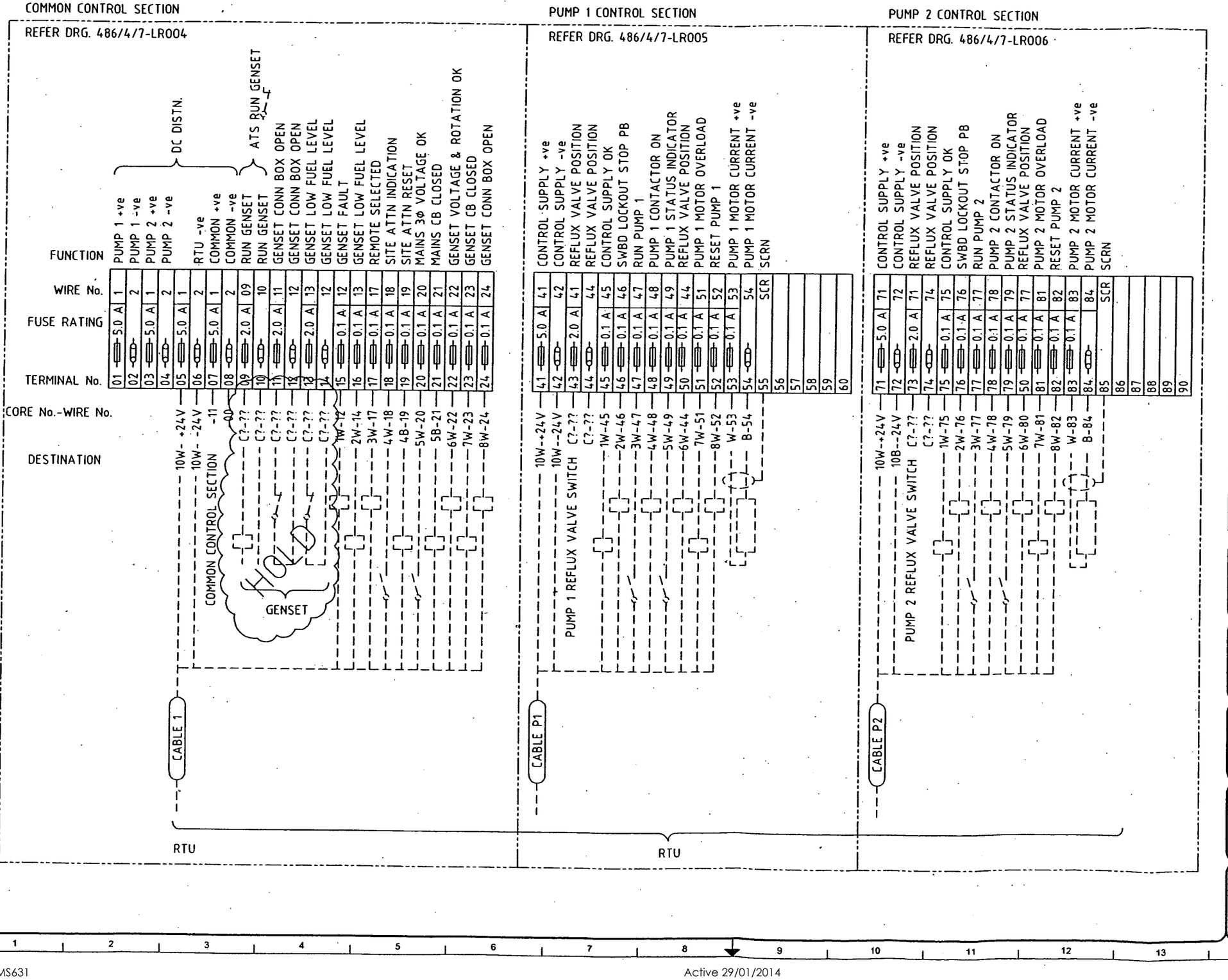
SCALE -

A.H. DATUM

N° 1 OF 1 SHEETS

DRAWING N°
486/4/7-LR006

AMEND.
B



AS BUILT

No	DATE	AMENDMENT	INITIALS
B	7.08.03	AS BUILT	

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Mooney 5596 — DATE 02/03

JOB FILE — CAD FILE 47LR007-RevB.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK	AJM	02/03
DRAWN	DPM	21.11.02
DRAFTING CHECK	R.K.	01/03

Brisbane City

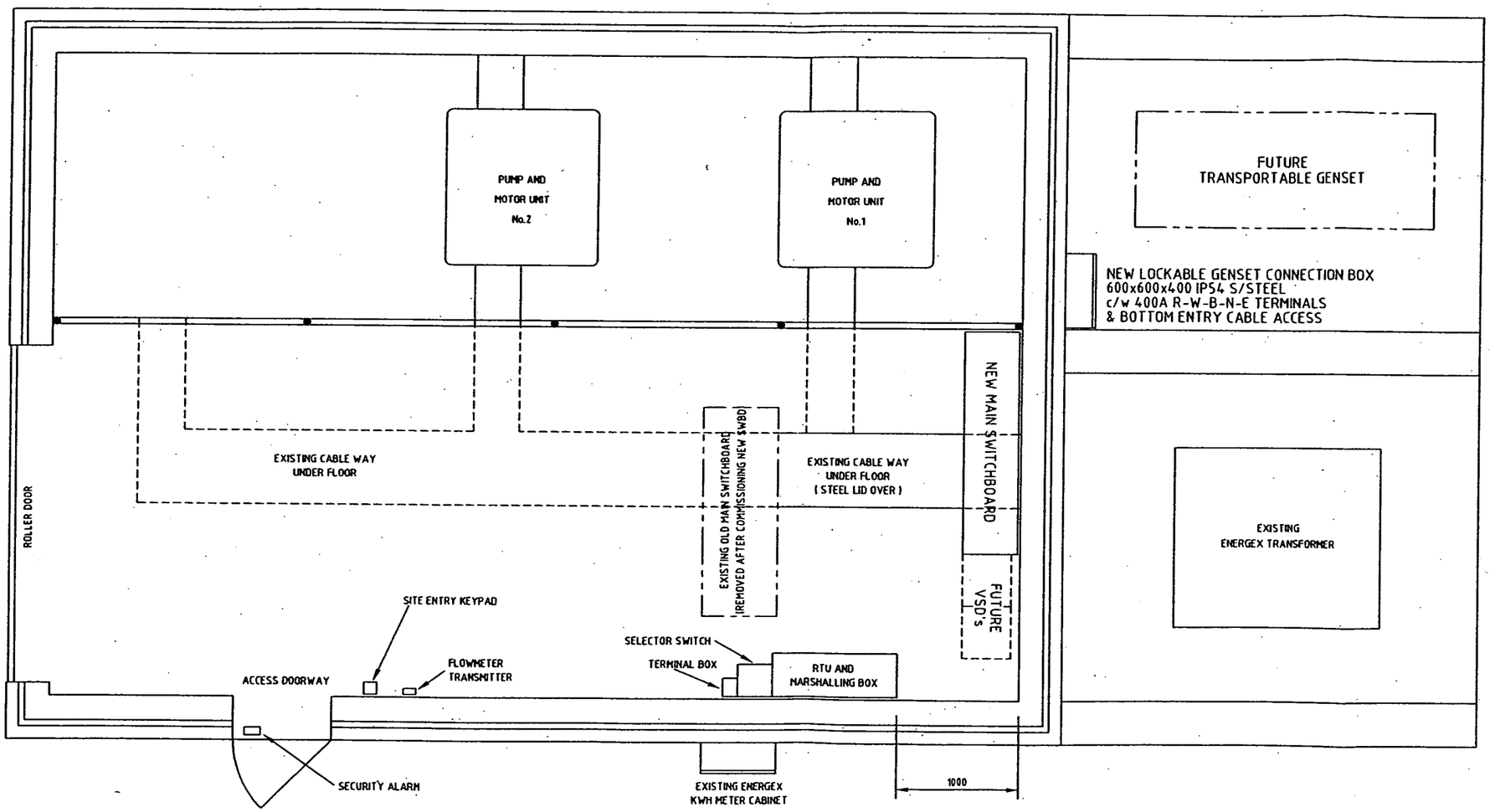
Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP19
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
CONTROL TERMINATIONS

SCALE - | A.H. DATUM | N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR007 | AMEND. B



PLAN

NO.	DATE	AMENDMENT	INITIALS
B	07.04.03	AS BUILT	
A	22.04.03	ISSUED FOR CONSTRUCTION	DPH

		NAME	DATE
DIRECTOR OF P.D. & P.S.	DATE		
ENGINEER IN CHARGE	DATE		
SUPERVISING ENGINEER	R.P.E.Q. NO. A.Mooney 5596 DATE 03/03	DESIGN	RJC 21.11.02
		DRAWN	DPH 21.11.02
		CHECKED	RJC 01/03

Brisbane City

JOB FILE			
ACAD FILE	47LR008-RevB	SHEET SIZE	A1
SURVEY No.		FIELD BOOK	
SURVEYED		A.H. DATUM	

Brisbane Water

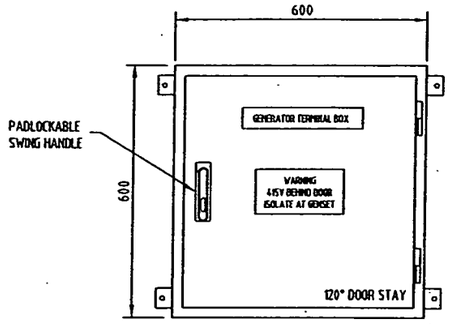
PROJECT: COCKLE St WP19 WATER PUMP STATION SWITCHBOARD UPGRADE

TITLE: MAIN SWITCHBOARD AREA LAYOUT

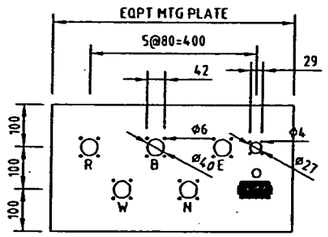
AS BUILT

SCALE - | N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR008 | AMEND. B

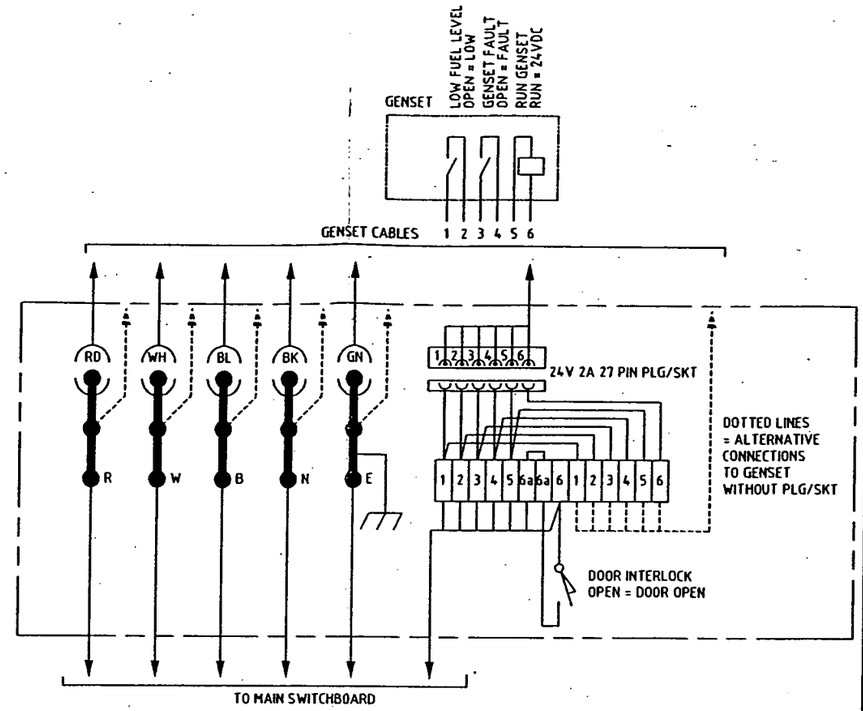


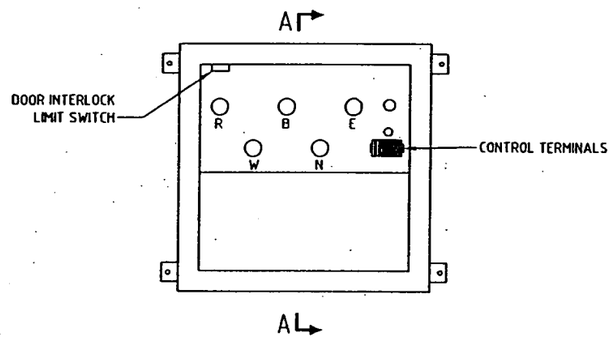
FRONT VIEW



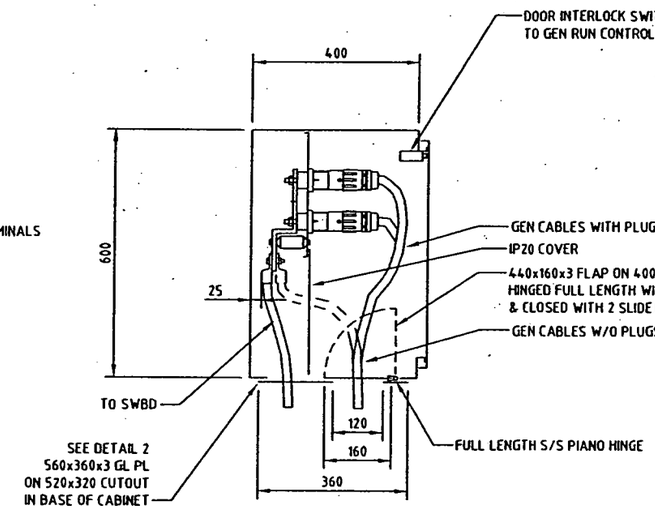
DETAIL 1

SOCKET PANEL - 2mm SM (PART OF EQPT MTG PL)

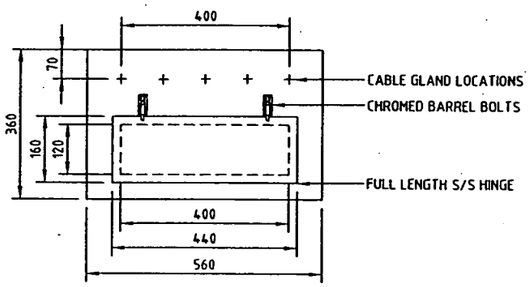




FRONT ELEVATION



SECTION A-A



DETAIL 2

CABLE ENTRY PLATE

NOTES

1. ENCLOSURE = B&R 21214/S OR EQUAL
   1.6mm s/s IP66
   C/W PADLOCKABLE SWING HANDLE &
   INTERNAL EQUIPMENT PLATE & MTG. KIT
   & MEB/S WALL MTG BKTS.
2. BASE OF CUBICLE TO BE CUTOUT 520x320
   FOR 560x360x3mm ALUMINUM CABLE ENTRY PLATE.
3. FLAP ON CABLE ENTRY PLATE TO BE 1.6mmS/S
   HINGED ALONG LONG EDGE AND HELD CLOSED
   WITH 2 CHROME PLATED BARREL BOLTS

AS BUILT

NO.	DATE	AMENDMENT	INITIALS
C	07.04.03	AS BUILT	
B	31.01.03	BOX MODIFIED CONSTRUCTION ISSUE	DPM

DIRECTOR OF P.D. & P.S. — DATE
ENGINEER IN CHARGE — DATE
SUPERVISING ENGINEER — R.P.E.Q. NO. A.Mooney 5597 — DATE 01/03

	NAME	DATE
DESIGN	R.K.	21.11.02
DRAWN	DPM	21.11.02
CHECKED	R.K.	01/03

Brisbane City

JOB FILE			
ACAD FILE	47R009-RevC.dwg	SHEET SIZE	A1
SURVEY No.		FIELD BOOK	
SURVEYED		A.H. DATUM	

Brisbane Water — Professional Service Engineering

PROJECT: COCKLE St WP19 WATER PUMP STATION SWITCHBOARD UPGRADE

TITLE: GENERATOR CONNECTION BOX GENERAL ARRANGEMENT

SCALE: - | N° 1 OF 1 SHEETS

DRAWING N°: 486/4/7-LR009 | AMEND.: C

Cockel Street Water Pumping Station WP19

RTU **Master - MITS MD3310**

PM	Slot 0	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15
PM-121 Processor Module	SPARE	RESRVD	DIM-102 Digital Input Module	DIM-102 Digital Input Module	DIM-102 Digital Input Module	DIM-102 Digital Input Module	SPARE	DOM-102 Digital Output Module	SPARE	SPARE	AIM-105 Analog Input Module	AIM-105 Analog Input Module	SPARE	SPARE	SPARE	SPARE

Brisbane Water

MITS,

Cockel Street Water Pumping Station WP19

RTU 1
Slot: 2
Card Type: DIM-102
Description: Digital Input Module

DI

I/O #	Description	Tag	Address	Off State	On State	Terminal #	Drawing #	Comment
0	Rtu 1 Battery power	rtu1batteryPower	DIM1.0	Ok	Fault			
1	Rtu 1 Mains power	rtu1mainsPower	DIM1.1	Fault	Ok			
2	Attention 1 Acknowledge	atn1acknowledge	DIM1.2	Off	On			
3	Security 1 Arm disarm	sec1armed	DIM1.3	Disarmed	Armed			
4	Security 1 Tamper	sec1tamper	DIM1.4	Ok	Active			
5	Security 1 Door limit switch	sec1doorLmtSwtch	DIM1.5	Closed	Open			
6	Reservoir 1 Mains power	res1mainsPower	DIM1.6	Ok	Fault			Sparkes Hill No. 1
7	Reservoir 1 High elect	res1highElect	DIM1.7	Ok	Fault			Sparkes Hill No. 1
8	Reservoir 1 Low elect	res1lowElect	DIM1.8	Ok	Fault			Sparkes Hill No. 1
9	Pump 1 Mains power	opm1mainsPower	DIM1.9	Fault	Ok			Sparkes Hill Res. 1 Pump 1 Chem
10	Pump 1 Run status	opm1runStatus	DIM1.10	Stopped	Running			Sparkes Hill Res. 1 Pump 1 Chem
11	Water_pumping_station 1 Mains CB Closded	stn1mainCBclsd	DIM1.11	Open	Closed			Cockle St
12	Water_pumping_station 1 Genset CB Closed	stn1genCBclsd	DIM1.12	Open	Closed			Cockle St
13	Water_pumping_station 1 Genset Voltage & Rotation OK	gen1phaseFlt	DIM1.13	Fault	OK			Cockle St
~~14~~	~~Water_pumping_station 1 Genset Fault~~	~~gen1status~~	~~DIM1.14~~	~~Fault~~	~~Healthy~~			Cockle St
15	Water_pumping_station 1 Generator Fule Low	gen1fuelOK	DIM1.15	OK	Low			Cockle St

Brisbane Water

MITS

Cockel Street Water Pumping Station WP19

RTU 1
Slot: 3
Card Type: DIM-102
Description: Digital Input Module

DI

I/O #	Description	Tag	Address	Off State	On State	Terminal #	Drawing #	Comment
0	Reservoir 2 Mains power	res2mainsPower	Dim2.0	Ok	Fault			Sparkes Hill No. 2
1	Reservoir 2 High elect	res2highElect	Dim2.1	Ok	Fault			Sparkes Hill No. 2
2	Reservoir 2 Low elect	res2lowElect	Dim2.2	Ok	Fault			Sparkes Hill No. 2
3	Reservoir station 1 Mains power	rst1mainsPower	Dim2.3	Fault	Ok			Stafford No. 1 and 2 Reservoirs
4	Reservoir 3 High elect	res3highElect	Dim2.4	Ok	Fault			Stafford No. 1
5	Reservoir 3 Low elect	res3lowElect	Dim2.5	Ok	Fault			Stafford No. 1
6	Water pumping station 1 Mains power	stn1EnergexFit	Dim2.6	Fault	Ok			Cockle St No. 2
7	Water pumping station 1 Local Remote Seector Switch	stn1localRemote	Dim2.7	Local	Remote			Cockle St No. 2
8	Generator Conection Box - Door Status	gen1doorStatus	Dim2.8	Closed	Open			Changed Description in Version 7
9	Spare	#	Dim2.9					
10	Spare	#	Dim2.10					
11	Spare	#	Dim2.11					
12	Spare	#	Dim2.12					
13	Spare	#	Dim2.13					
14	Spare	#	Dim2.14					
15	Spare	#	Dim2.15					

Brisbane Water

MITS

Cockel Street Water Pumping Station WP19

RTU 1
Slot: 4
Card Type: DIM-102
Description: Digital Input Module

DI

I/O #	Description	Tag	Address	Off State	On State	Terminal #	Drawing #	Comment
0	Reservoir 4 High elect	res4highElect	Dim3.0	Ok	Fault			Stafford No. 2
1	Reservoir 4 Low elect	res4lowElect	Dim3.1	Ok	Fault			Stafford No. 2
2	Pump station 1 Mains power	ops1mainsPower	Dim3.2	Fault	Ok			Sparkes Hill Res. 2 Pump 1 Chem
3	Pump 2 Run status	opm2runStatus	Dim3.3	Stopped	Running			Sparkes Hill Res. 2 Pump 1 Chem
4	Pump 3 Run status	opm3runStatus	Dim3.4	Stopped	Running			Sparkes Hill Res. 2 Pump 2 Chem
5	Pump station 2 Mains power	ops2mainsPower	Dim3.5	Fault	Ok			Stafford No. 1 Chemical
6	Pump 4 Run status	opm4runStatus	Dim3.6	Stopped	Running			Stafford No. 1 Chemical
7	Pump 5 Run status	opm5runStatus	Dim3.7	Stopped	Running			Stafford No. 2 Chemical
8	Water pump 1 Run status	pmp1runStatus	Dim3.8	Stopped	Running			Cockle St No. 2 Pump 1
9	Water pump 1 Mains power raw	pmp1mainsPower	Dim3.9	Fault	Ok			Cockle St No. 2 Pump 1
10	Water pump 1 Reflux Open	pmp1rflxSwitch	Dim3.10	Not Open	Open			Cockle St No. 2 Pump 1
11	Water pump 1 Motor Overload Trip	pmp1thrmlOverload	Dim3.11	Healthy	Fault			Cockle St No. 2 Pump 1
12	Spare	#	Dim3.12					
13	Water pump 1 Fault Reset Push Button	pmp1localReset	Dim3.13	Not Pressed	Pressed			Cockle St No. 2 Pump 1
14	Water pump 1 Emergency Stop Push Button	pmp1emergStop	Dim3.14	Pressed	Not Pressed			Cockle St No. 2 Pump 1
15	Spare	#	Dim3.15					

Brisbane Water

MITS

Cockel Street Water Pumping Station WP19

RTU 1
Slot: 5
Card Type: DIM-102
Description: Digital Input Module

DI

I/O #	Description	Tag	Address	Off State	On State	Terminal #	Drawing #	Comment
0		#	Dim4.0					
1		#	Dim4.1					
2		#	Dim4.2					
3		#	Dim4.3					
4		#	Dim4.4					
5		#	Dim4.5					
6		#	Dim4.6					
7		#	Dim4.7					
8	Water pump 2 Run status	pmp2runStatus	Dim4.8	Stopped	Running			Cockle St No. 2 Pump 2
9	Water pump 2 Mains power raw	pmp2mainsPower	Dim4.9	Fault	Ok			Cockle St No. 2 Pump 2
10	Water pump 2 Reflux Open	pmp2rflxSwitch	Dim4.10	Not Open	Open			Cockle St No. 2 Pump 2
11	Water pump 2 Motor Overload Trip	pmp2thmlOverload	Dim4.11	Healthy	Fault			Cockle St No. 2 Pump 2
12	Spare	#	Dim4.12					
13	Water pump 2 Fault Reset Push Button	pmp2localReset	Dim4.13	Not Pressed	Pressed			Cockle St No. 2 Pump 2
14	Water pump 2 Emergency Stop Push Button	pmp2emergStop	Dim4.14	Pressed	Not Pressed			Cockle St No. 2 Pump 2
15	Spare	#	Dim4.15					

Brisbane Water

MITS

Cockel Street Water Pumping Station WP19

RTU 1
Slot: 7
Card Type: DOM-102
Description: Digital Output Module

DO

I/O #	Description	Tag	Address	Off State	On State	Terminal #	Drawing #	Comment
0	Attention 1 Indicator lamp	atn1Indicator	Dom1.0	Off	On			
1	Security 1 Audible	sec1audible	Dom1.1	Off	On			
2	Spare	#	Dom1.2					
3	Spare	#	Dom1.3					
4	Spare	#	Dom1.4					
5	Water pump 1 Run Relay	pmp1operate	Dom1.5	Stop	Run			Cockle St No. 2
6	Water pump 1 Status Indication Lamp	pmp1indicator	Dom1.6	Off	On			Cockle St No. 2
7	Water pump 2 Run Relay	pmp2operate	Dom1.7	Stop	Run			Cockle St No. 2
8	Water pump 2 Status Indication Lamp	pmp2indicator	Dom1.8	Off	On			Cockle St No. 2
9	Spare	#	Dom1.9					
10	Spare	#	Dom1.10					
11	Spare	#	Dom1.11					
12	Spare	#	Dom1.12					
13	Spare	#	Dom1.13					
14	Spare	#	Dom1.14					
15	Spare	#	Dom1.15					

Brisbane Water

MITS

Cockel Street Water Pumping Station WP19

RTU 1
Slot: 10
Card Type: AIM-105
Description: Analog Input Module

AI

I/O #	Description	Tag	Address	Off State	On State	Terminal #	Drawing #	Comment
0	Reservoir 1 Level raw	res1levelAI	Aim1.0					
1	Chemical tank 1 Level raw	cht1levelAI	Aim1.1					
2	Chemical tank 2 Level raw	cht2levelAI	Aim1.2					
3	Reservoir 3 Level raw	res3levelAI	Aim1.3					
4	Chemical tank 4 Level raw	cht4levelAI	Aim1.4					
5		#	Aim1.5					
6		#	Aim1.6					
7		#	Aim1.7					
8		#	Aim1.8					
9		#	Aim1.9					
10		#	Aim1.10					
11		#	Aim1.11					
12		#	Aim1.12					
13		#	Aim1.13					
14		#	Aim1.14					
15		#	Aim1.15					

Brisbane Water

MITS

Cockel Street Water Pumping Station WP19

RTU 1
Slot: 11
Card Type: AIM-105
Description: Analog Input Module

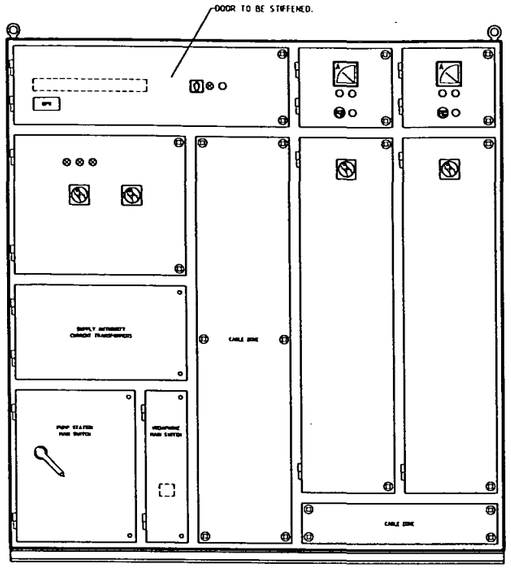
AIM

I/O #	Description	Tag	Address	Off State	On State	Terminal #	Drawing #	Comment
0	Reservoir 2 Level raw	res2levelAI	Aim2.0					
1	Chemical tank 3 Level raw	cht3levelAI	Aim2.1					
2	Reservoir 4 Level raw	res4levelAI	Aim2.2					
3	Chemical tank 5 Level raw	cht5levelAI	Aim2.3					
4	Flow meter 1 Flow rate raw	flw1flowRateAI	Aim2.4					
5	Flow meter 2 Flow rate raw	flw2flowRateAI	Aim2.5					
6	Water pump 1 Motor current raw	pmp1motorCurrAI	Aim2.6					
7	Water pump 2 Motor current raw	pmp2motorCurrAI	Aim2.7					
8	Security 2 Loop raw	secAD1BH1AccAI	Aim2.8					
9	Security 3 Loop raw	secAD2BH2AccAI	Aim2.9					
10	Security 4 Loop raw	secAD3AD4AccAI	Aim2.10					
11	Security 5 Loop raw	secBH3AccessAI	Aim2.11					
12	Security 6 Loop raw	secED1AccessAI	Aim2.12					
13	Security 7 Loop raw	secAH1BH4AccAI	Aim2.13					
14	Security 8 Loop raw	secAD5AccessAI	Aim2.14					
15		#	Aim2.15					

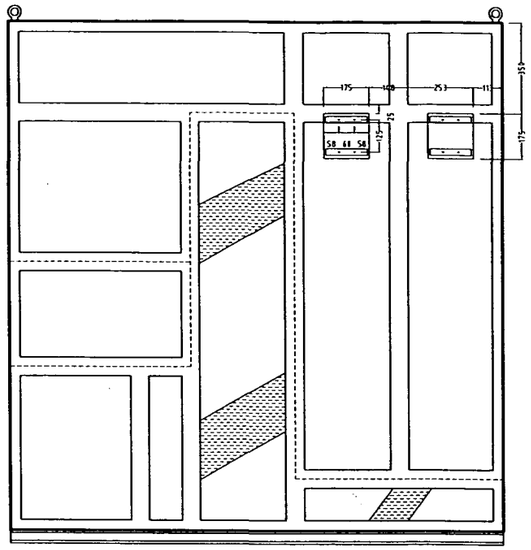
Document Register

PROJECT:Cockle Street Pump Station WP08 **JOB NO.JO6893**

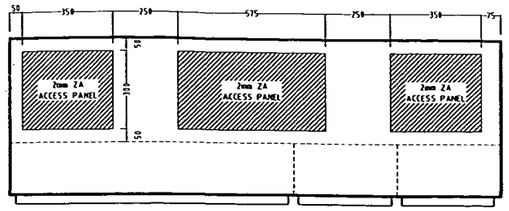
DRG / DOC NO.	DESCRIPTION	REV NO.	REV NO.	REV NO.	REV NO.	REV NO.	REV NO.	REV NO.	REV NO.	REV NO.	REV NO.	COMMENTS
06893-E-001	Switchboard General Arrangement	0	1	2								
06893-E-002	Genset Cubicle General Arrangement	0	1	2								
06893-ES-001	Equipment Schedule	0	1	2								



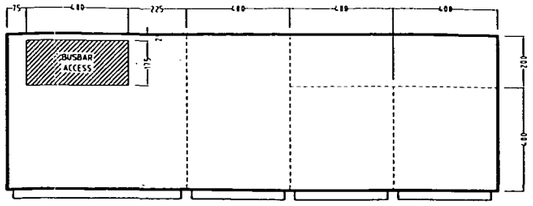
FRONT VIEW



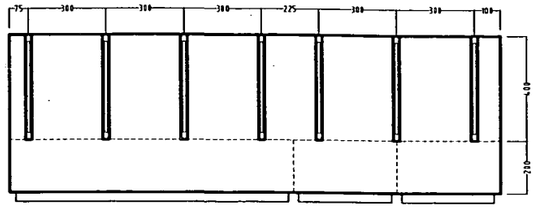
FRONT VIEW
(REAR WALL)



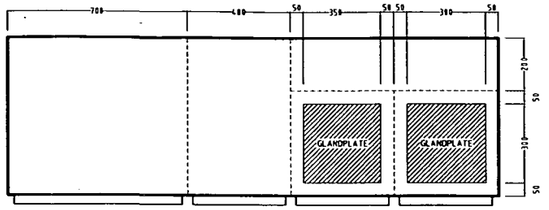
PLAN VIEW U



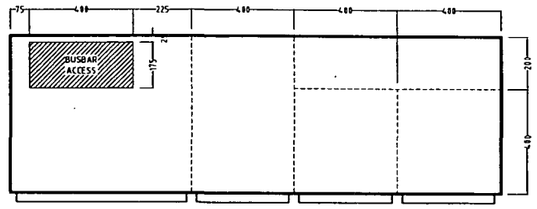
PLAN VIEW X



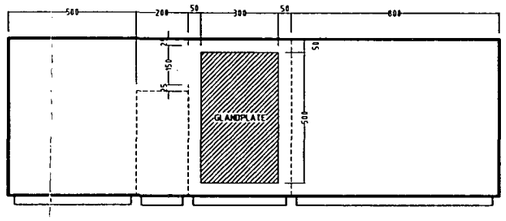
PLAN VIEW V



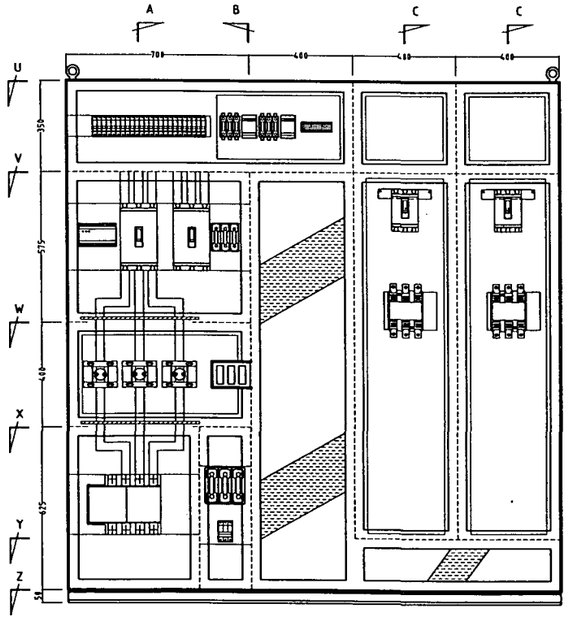
PLAN VIEW Y



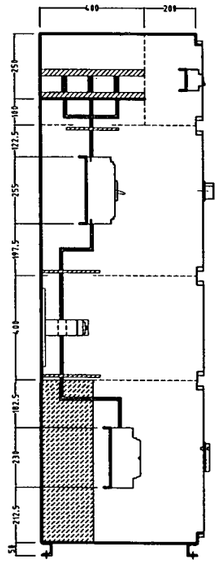
PLAN VIEW W



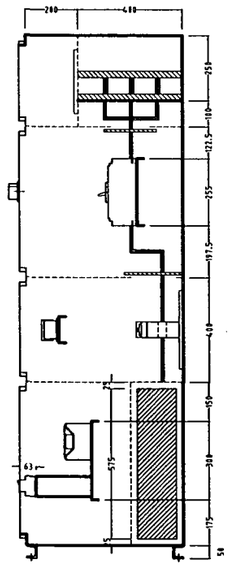
PLAN VIEW Z



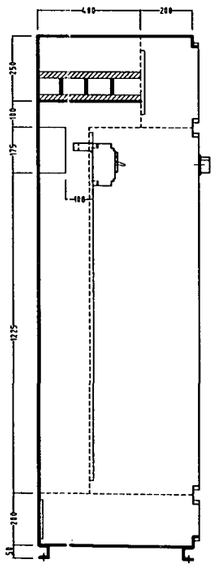
FRONT VIEW
(DOORS REMOVED)



SECTION VIEW A



SECTION VIEW B



SECTION VIEW C

CONSTRUCTION DETAILS

CONSTRUCTION	MACHINE FORMED AND WELDED. FRONT CONNECTED, FLOOR MOUNTED. ALL JOINTS TO BE CONTINUOUSLY WELDED.
MATERIAL	2.0mm ZINCANNEAL SHEET STEEL CUBICLES AND DOORS. 2.0mm ZINCANNEAL GEAR TRAYS.
FASTENERS	MILD STEEL NUTS & BOLTS.
LIFTING FACILITY	EYE BOLTS (HOT DIP GALVANISED)
CABLE ENTRIES	BOTTOM ONLY AS SHOWN.
GLANDPLATES	6mm ALUMINIUM WITH DUSTSEALS (UNPAINTED)
PLINTH	50x 50x 5mm MLS ANGLE IRON FRAME POWDERCOATED AFTER FABRICATION.
DOORS	FITTED WITH CHROME PLATED BRASS PINTLE HINGES. CHROME PLATED COM TYPE 1/4 TURN LOCKS. CT SECTION TO HAVE ACORN NUTS WITH SUPPLY AUTHORITY SEALABILITY. MAIN SWITCH SECTION TO HAVE ACORN NUTS WITH SUPPLY AUTHORITY SEALABILITY. ZINC PLATED DOOR STAYS MIN. 165deg OPENING.
STIFFENING	ALL DOORS OVER 1600mm HIGH.
WEATHER SEALS	NEOPRENE RUBBER AROUND EACH DOOR.
BUSBARS	ROUNDED-EDGE HOHC COPPER TO AS 3439.
BUSBAR JOINTS	ALL BUSBAR JOINTS TO USE HIGH TENSILE BOLTS AND NUTS WITH BELVILLE WASHERS.
BUSBAR SUPPORTS	12mm PERMALI DENSIFIED WOOD MOULDED THERMOSET POLYESTER RESIN GLASS FILLED SUPPORTS
FAULT LEVEL	36KA
SEGREGATION	FORM 3B TO AS 3439.1
PROTECTION	IP42 DUSTPROOF

WIRING	POWER- PVC INSULATED V75 MINIMUM 2.5mm sq. PHASE COLOURED
	CURRENT METERING- PVC INSULATED V75 MINIMUM 2.5mm sq. RED, WHITE, BLUE, GREY
	POTENTIAL METERING- PVC INSULATED V75 MINIMUM 1.5mm sq. RED, WHITE, BLUE, BLACK
	CONTROL- PVC INSULATED V75 1.5mm sq FLEX 240VAC CONTROL WHITE 240VAC NEUTRAL BLACK 24V ELV POSITIVE ORANGE 24V ELV NEGATIVE VIOLET PVC INSULATED V75 0.5mm sq FLEX 24V RTU I/O POSITIVE GREY 24V RTU I/O NEGATIVE GREY
	EARTH- PVC INSULATED V75 MINIMUM 2.5mm sq. GREEN/YELLOW PVC INSULATED V75 4.0mm sq. GREEN/YELLOW
	MARKERS- GRAFOPLAST EQUIVALENT BLACK TEXT ON WHITE
FINISH	ELECTROSTATIC POWDER COATED.
PREPARATION	CLEAN, DEGREASE AND GRIND SMOOTH
EXTERNAL COLOUR	X15 ELECTRIC ORANGE
INTERNAL COLOUR	DULUX BRIGHT WHITE
EQUIPMENT PANELS	DULUX BRIGHT WHITE
LABELS	MATERIAL- ENGRAVED TRAFFOLYTE FIXING- M3 x 6 TAPTIGHTS COLOUR- W/B/W UNLESS NOTED IN SCHEDULE

AS BUILT

REV.	DRAWN BY	DATE	CHECKED BY	DESIGNED BY	ENGINEER	APPROVED BY	REVISION TITLE
2	R.FREELAND	08-03	C.HOLMES	R.FREELAND	N.WEBER	C.HOLMES	ISSUED AS CONSTRUCTED
1	R.FREELAND	05-03	C.HOLMES	R.FREELAND	N.WEBER	C.HOLMES	ISSUED FOR CONSTRUCTION
0	R.FREELAND	05-03	C.HOLMES	R.FREELAND	N.WEBER	C.HOLMES	ISSUED FOR APPROVAL

CLIENT: Brisbane City / Brisbane Water

DESIGNED BY: ELECTRIC (AUST) PtyLtd
A.C.N. 011 010 807
QLD: (07) 3256 1522 VIC: (03) 9466 3977
NSW: (02) 9672 7922 WA: (08) 9470 4292

TITLE: COCKLE STREET PUMP STATION WP08
MAIN SWITCHBOARD
GENERAL ARRANGEMENT

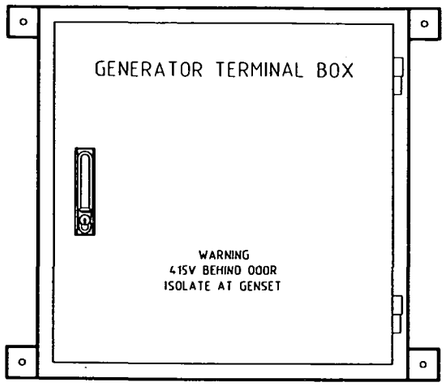
BRISBANE WATER DRAWING NO.: 486/4/7 - LR011

DRAWING NO.: 06893-E-001 (2) SHEET: B1

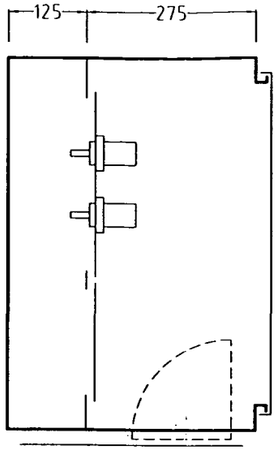
SCALE: 1 : 10 SHEET 1 OF 1

OFFICE: QUEENSLAND FILENAME: 06893e001

STANDARD DESIGNATION B1 - 1188 x 787mm



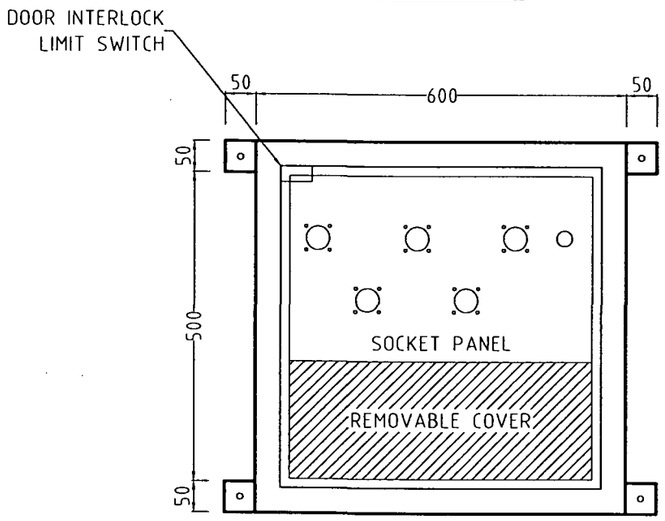
FRONT VIEW



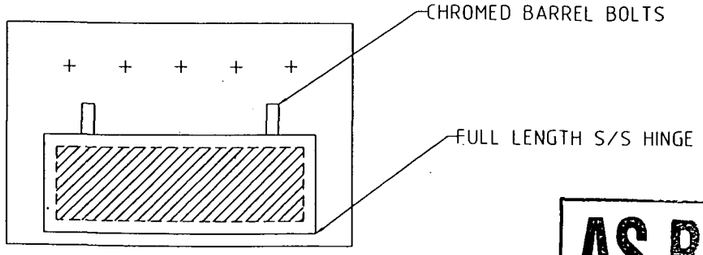
SECTIONAL VIEW

CONSTRUCTION DETAILS

CONSTRUCTION	MACHINE FORMED AND WELDED. FRONT CONNECTED. WALL MOUNTED. ALL JOINTS TO BE CONTINUOUSLY WELDED.
MATERIAL	1.6mm MARINE GRADE STAINLESS STEEL 316 CUBICLE AND DOORS. 2.0mm ZINCANNEAL GEAR TRAYS.
FASTENERS	316 GRADE STAINLESS STEEL NUTS & BOLTS.
CABLE ENTRIES GLANDPLATES	BOTTOM ONLY AS SHOWN. 3mm ALUMINIUM WITH DUSTSEALS (UNPAINTED)
DOORS	FITTED WITH CHROME PLATED BRASS PINTLE HINGES. CHROME PLATED PADLOCKABLE SWING HANDLE S/S DOOR STAYS MIN. 120deg OPENING.
STIFFENING	ALL DOORS OVER 1000mm HIGH.
WEATHER SEALS	NEOPRENE RUBBER AROUND EACH DOOR.
SEGREGATION	FORM 1 TO AS 3439.1
PROTECTION	IP66 WEATHER PROOF
FINISH	N4
PREPARATION	CLEAN, DEGREASE AND GRIND SMOOTH
EQUIPMENT PANELS	GLOSS WHITE
LABELS	MATERIAL- ENGRAVED TRAFFOLYTE FIXING- M3 x 6 TAPTIGHTS COLOUR- W/B/W UNLESS NOTED IN SCHEDULE

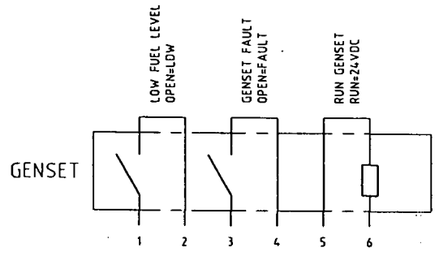


FRONT VIEW
(DOOR REMOVED)

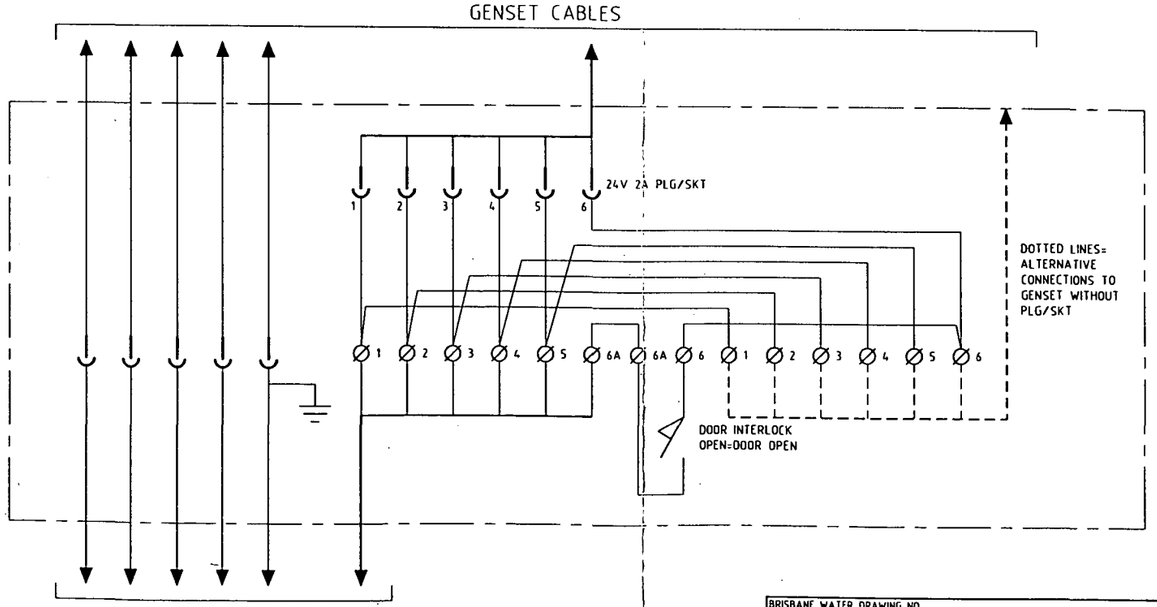


CABLE ENTRY PLATE

AS BUILT



GENSET CABLES



TO MAIN SWITCHBOARD

REV.	DRAWN BY	DATE	CHECKED BY	DESIGNED BY	ENGINEER	APPROVED BY	REVISION TITLE
2	R.FREELAND	08-03	C.HOLMES	R.FREELAND	N.WEBER	C.HOLMES	ISSUED AS CONSTRUCTED
1	R.FREELAND	05-03	C.HOLMES	R.FREELAND	N.WEBER	C.HOLMES	ISSUED FOR CONSTRUCTION
0	R.FREELAND	05-03	C.HOLMES	R.FREELAND	N.WEBER	C.HOLMES	ISSUED FOR APPROVAL

CLIENT: Brisbane City — Brisbane Water

DESIGNED BY: ELECTRIC (AUST) PtyLtd
A.C.N. 011 010 807
QLD: (07) 3256 1522 VIC: (03) 9466 3977
NSW: (02) 9672 7922 WA: (08) 9470 4292

TITLE: COCKLE ST PUMP STATION WP08
GENERATOR CONNECTION BOX
GENERAL ARRANGEMENT

BRISBANE WATER DRAWING NO.: 486/4/7 - LR012

DRAWING NO.: 06893-E-002 2 | SHEET: A3

SCALE: N.T.S. | SHEET 1 OF 1

OFFICE: QUEENSLAND | FILENAME: 06893e002

Item No.	Equipment	Make	Qty.	Cat. No.	Designation	Label	Size	Text	Colour
				Cockle St Pump Station					
					Incoming				
	C/Breaker 630ATP	Merlin Gerin	1	NS630N 32893	Normal Supply Circuit Breaker	Q1	150 x 50	10	W/B/W
	C/Breaker 400ATP	Merlin Gerin	1	NS400N 32693	Generator Supply Circuit Breaker	Q2	150 x 50	10	W/B/W
	Aux. Contacts	Merlin Gerin	2	29450	Aux. Contacts				
	Mechanical Interlock	Merlin Gerin	1	32621	Interlock				
	Handle	Merlin Gerin	2	32598	Handle				
	Fuse Holder	GEC	6	RS20H	Fuse Holder	F4, F5, F6, F7, F8, F9	Strip	6	W/B/W
	Fuse Cartridge	GEC	6	NIT2	Fuse Cartridge	F4, F5, F6, F7, F8, F9	Strip	6	W/B/W
	Indicator Light	Telemecanique	3	ZB4-AVM5 240V	Power On Indicators				
	Neutral Link	Clipsal	1	L5	Neutral Link	L1	12 x 50	6	W/B/W
	Fuse Holder	GEC	3	RS63H	Fuse Holder	F1, F2, F3	Strip	6	W/B/W
	Fuse Cartridge	GEC	3	NIT20	Fuse Cartridge	F1, F2, F3	Strip	6	W/B/W
	Phase Failure Relay	Telemecanique	2	RM4-TR32	Phase Failure Relay	K1a, K1b	12 x 50	6	W/B/W
	Surge Diverters	Critec	3	TDS-MT-277	Surge Diverters	SD1	Strip	6	W/B/W
	Load Break Switch	Telemecanique	1	INS630	Main isolator				
	Handle	Merlin Gerin	1	31052	Handle				
					Distribution				
	C/Breaker 1Ø 63ASP	Merlin Gerin	1	25809	RTU Panel	3Q1	12 x 50	6	W/B/W
	C/Breaker 1Ø 32ASP	Merlin Gerin	2	25806	Chemical Pump Panel & Spare	4Q1, 7Q1	Strip	6	W/B/W
	C/Breaker 1Ø 16ASP	Merlin Gerin	1	25803	Pump Staion L&P Sub Board	5Q1	Strip	6	W/B/W
	C/Breaker 1Ø 10ASP	Merlin Gerin	1	25802	Spare	8Q1	Strip	6	W/B/W
	RCD C/Breaker 1Ø 10ASP	Merlin Gerin	1	11750	GPO	6Q1	Strip	6	W/B/W
	C/Breaker 3Ø 63ATP	Merlin Gerin	1	25837	Vodaphone Supply	10Q1	Strip	6	W/B/W
	Fuse Holder	GEC	3	RS100H	Vodaphone Supply				
	Fuse Cartridge	GEC	3	NIT63	Vodaphone Supply				
	GPO	Clipsal	1	15					
	Neutral Link	Clipsal	1	L10	Neutral Link				
	Buscomb	Telemecanique	1	14893	Buscomb				
					Common Controls				
	Selector Switch	K & N	1	CAD12A222-600 FT2 V845 Remote/Local	Selector Switch	S1	Strip	6	W/B/W
	Indicator Light	Telemecanique	1	ZB5-AVB4 24V	Indicator Light	H1	Strip	6	W/B/W
	Pushbutton Head	Telemecanique	1	ZB5-AA6	Reset	S2	Strip	6	W/B/W
	Pushbutton Body	Telemecanique	1	ZB5-AZ105		S2	Strip	6	W/B/W
					Pumps 1 & 2				
	Motor Circuit Breaker 400ATP	Merlin Gerin	2	NS400N 32750	Motor Circuit Breaker	1Q1, 2Q1	12 x 50	6	W/B/W
	NS400 Bus Plugs	Merlin Gerin	2	BP3400	NS400 Bus Plugs				
	NS400 Rotary Handle	Merlin Gerin	2	32598	NS400 Rotary Handle				
	Motor Contactor	Telemecanique	2	LC1-F330	Motor Contactor	1K3, 2K3	Strip	6	W/B/W
	Motor Overload	Telemecanique	2	LR9-F7375	Motor Overload	1O/L, 2O/L	Strip	6	W/B/W
	Current Transformer	IME	2	TAI 400 400/5	Current Transformer	1T1, 2T1	Strip	6	W/B/W
	Current Transducer	Crompton	2	253-TAC-W/4-20MA/24VDC	Current Transducer				
	Ammeter	Crompton	2	96 x 96 0-400amp 4-20ma	Ammeter	1M1, 2M1			
	C/Breaker 1Ø 2ASP	Merlin Gerin	2	25798	Control	1Q2, 2Q2	Strip	6	W/B/W
	Control Relay	Telemecanique	4	CA2-DN22	Control Relay	1K1, 2K1,	Strip	6	W/B/W

AS BUILT

Item No.	Equipment	Make	Qty.	Cat. No.	Designation	Label	Size	Text	Colour
				Cockle St Pump Station					
	RTU Relay	Izumi	4	RY4S-UL + BASE	RTU Relay	1K2, 1K41K4,2K4	Strip	6	W/B/W
	Pushbutton Body	Telemecanique	4	ZB5-AZ105	Pushbutton Body	1S2, 1S3, 2S2, 2S3	Strip	6	W/B/W
	Pushbutton Head	Telemecanique	2	ZB5-AA6	Reset	1S3, 2S3	Strip	6	W/B/W
	Pushbutton Head	Telemecanique	2	ZB5-AA3	Start	1S2, 2S2	Strip	6	W/B/W
	On Delay Timer	Telemecanique	2	RE7TL11BU D/ON	On Delay Timer	1T1, 2T1	Strip	6	W/B/W
	Emergency Stop PB	Telemecanique	2	ZB5-AS44, ZB5-AZ105	Emergency Stop PB				
	Indicator Light	Telemecanique	2	ZB5-AVB4 24V	Indicator Light	1H1, 2H1	Strip	6	W/B/W
	Neutral Link	Alstom	2	RS20H	Neutral Link	1L2, 2L2	Strip	6	W/B/W
					Control Terminations				
	Link Terminals	Phoenix	24	UK5N 4MM	Link Terminals		Strip	6	W/B/W
	Fused Terminals	Phoenix	36	UK5HESI 4MM	Fused Terminals		Strip	6	W/B/W
	Terminal End Plates	Phoenix	2	D/UK 4/10 4MM	Terminal End Plates		Strip	6	W/B/W
	Fuses – 5A	RS	6	385-4620	Fuses – 5A		Strip	6	W/B/W
	Fuses – 2A	RS	4	385-7859	Fuses – 2A		Strip	6	W/B/W
	Fuses – 100mA	RS	26	384-0154	Fuses – 100mA		Strip	6	W/B/W
					Genset Terminal Box				
	Link Terminals	Clipsal	1	3PL4PD51	Link Terminals		Strip	6	W/B/W
	Terminals	Phoenix	13	UK4	Terminals		Strip	6	W/B/W
	Door Switch	Camsco	1	SM-202	Door Switch				
	Control Socket	Colourview	1	MS3100F 18-1S	Control Socket				
					Spares				
	C/Breaker 1Ø 63ASP	Merlin Gerin	1	25809	C/Breaker				
	C/Breaker 1Ø 32ASP	Merlin Gerin	1	25806	C/Breaker				
	C/Breaker 1Ø 16ASP	Merlin Gerin	1	25803	C/Breaker				
	C/Breaker 1Ø 10ASP	Merlin Gerin	1	25802	C/Breaker				
	C/Breaker 3Ø 63ATP	Merlin Gerin	1	25837	C/Breaker				
	Selector Switch	K & N	1	CAD12A222-600 FT2 V845 Remote/Local	Selector Switch				
	Motor Contactor	Telemecanique	1	LC1-F330	Motor Contactor				
	Motor Overload	Telemecanique	1	LR9-F7375	Motor Overload				
	Control Relay	Telemecanique	1	CA2-DN22	Control Relay				
	Pushbutton Body	Telemecanique	2	ZB5-AZ101	Pushbutton Body				
	Pushbutton Head	Telemecanique	1	ZB5-AA6	Pushbutton Head				
	Pushbutton Head	Telemecanique	1	ZB5-AA3	Pushbutton Head				
	Fuses – 5A	RS	6	385-4620	Fuses – 5A				
	Fuses – 2A	RS	6	385-7859	Fuses – 2A				
	Fuses – 100mA	RS	6	384-0154	Fuses – 100mA				
	Fuse Cartridge	GEC	6	NIT2	Fuse Cartridge				
	Fuse Cartridge	GEC	6	NIT20	Fuse Cartridge				
	Indicator Light	Telemecanique	2	ZB5-AVB4 24V	Indicator Light				
	Indicator Light	Telemecanique	2	ZB4-AVM5 240V	Indicator Light				
	Cubicle	Custom	1	Switchboard					
	Cubicle	Custom	1	Generator Terminal Box					

AS BUILT

SJ ELECTRIC

TEST BEFORE YOU TOUCH

№ 00223

TEST SHEET

CUSTOMER NAME: BRISBANE WATER SWITCHBOARD ID: STATION MSB DATE: 29/7/03

CUSTOMERS ADDRESS: COCKLE ST PUMP STATION JOB No.: Jo 6893

C/B NO.	CABLE SIZE	C/B SIZE	N NO.	CIRCUIT DESCRIPTION	A-E Ω	N-E MΩ	Fault loop Impendence measurement	RCD TEST	A-E VOLTS	A-N VOLTS	A-N VOLTS	ø-ø VOLTS	EARTH CONT.	CORRECT CIRCUIT CONNECTION	VISUAL INSPECTION
M/S	400	630	M/N 4	MAINS	∞	∞	ENERGISED CHECK ✓	—	250	247	250	430	ENERGISED CHECK ✓	✓	✓
M/S	16	63	M/N 3	PHONE TUR SUPPLY.	∞	∞	<0.23 ✓	—	250	247	250	430	0.1	✓	✓
P1	150	400	—	PUMP 1	∞	∞	✓	—	250	—	—	430	0	✓	✓
P2	150	400	—	PUMP 2	∞	∞	✓	—	250	—	—	430	0	✓	✓
1	4	10	N/L 4	RTU/MARSHALLING	∞	∞	<0.57 ✓	—	250	247	—	—	0.1	✓	✓
3	2.5	16	N/L 6	PUMP STATION LT	∞	∞	<0.62 ✓	—	250	250	—	—	0.1	✓	✓
4	2.5	16	N/L 7	SW/BRD GPO	∞	∞	RCD	✓	250	251	—	—	0.1	✓	✓
4	2.5	20	N/L 7	FIELD GPO	∞	∞	RCD	✓	250	247	—	—	0.1	✓	✓
8	6	20	N/L 8	3 Ø OUTLET	∞	∞	RCD	✓	250	250	—	430	0.1	✓	✓
5	6	32	N/L 5	SPARKES HILL LRP NO1	∞	∞	<0.35 ✓	—	250	250	—	—	OWN EARTH STAKE	✓	✓
GEN SUPPLY	150	400	M/N 2	GENERATOR FEED	∞	∞	✓	—	—	—	—	—	0	✓	✓

TEST EQUIPMENT: KYORITSU

SERIAL NO: 0769027

TEST DUE DATE: 29/10/03

NAME: MICK FRANKS

LIC NO: 38985

SIGNATURE: M.F.B.

SJ-61 ISSUE 1

ELECTRIC

Project: Cockie Street Pump Station WP8
Customer: Brisbane Water
Contract No: BW 43-401/02

INSPECTION & TEST PLAN
Manufacturing

Quality Plan: J06893
ITP No:.QA3ITP - 001
Issue No: 3

PROJECT ACTIVITIES				* ACTIVITY BY			ACCEPTANCE CRITERIA	VERIFYING DOCUMENT
No.	PROCESS	INSPECTION	ACCEPTANCE	*SJ*	Brisbane Water	*SIGNATURE/ DATE*		
1	Cubicles	Metal inspection	Checks completed as per Check list		A		Check List QA3CH - 010	PSE-SSM001B
2	Painting	Paint Inspection	Checks completed as per check list		A			PSE-SSM001B
3	Switchgear assembly	Check materials are correct	Checks completed as per check list and suppliers delivery.	P			Check list QA3CH - 005	PSSE-SSM001B PSE-SSM030C
4	Factory testing		Test completed as per check lists	P	W		Check list QA3CH - 015 Check list QA3CH - 020	PSE-SSM001B Drawings TBA

LEGEND

W-Witness Point H-Hold Point
A-Accept P-Perform
C-Certify

ELECTRIC

QUALITY PLAN: J06893
CHECK LIST NO: QA3CH-005
ISSUE NO: 3 PAGE 1 OF 2

SWITCHBOARD AND CONTROL PANEL
SWITCHGEAR ASSEMBLY

CUSTOMER: Brisbane Water
PROJECT: Cockie Street Pump Station WP8
CONTRACT NO: BW 43-401/02

PLANT: LOCATION / AREA: DRG NO:	TEST EQPT: VISUAL TYPE: SERIAL NO:

ITEM NO	ACTIVITY DESCRIPTION	CHECKED (TICK)	Comment
	Engraving		
1	Labels level	(✓)	.....
2	Legible (letter height as per specification)	(✓)	.....
3	Fixing	(✓)	.....
4	Material as per specification	(✓)	.....
			....
	Duct/din rail		
5	Level	(✓)	
6	Fixing	(✓)	.....
			.....
	Earth and Neutral Bars		..
7	Neutral no. of holes	(✓)	
8	Earth no. of holes	(✓)	
9	Neutral bar no. screws	(✓)	.....
10	Earth bar no screws	(✓)	.....
11	Neutral bar hole size	(✓)	.....
12	Neutral bar hole size	(✓)	.....
			.....
	Equipment		.....
13	Equipment Layout	(✓)	.....
14	Correct Equipment	(✓)	
15	Equipment level	(✓)	
16	Equipment fix	(✓)	.....
			.....
			.....
			PASS

CHECKED BY: JUSTIN MULLIGAN SIGNATURE: ELECTRICAL LICENCE NO: 38779 DATE: 17/03	APPROVED BY: SIGNATURE: DATE: 17/3/03

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 1994, AS3000 1991 and AS3008.1 1989.

ELECTRIC

QUALITY PLAN: J06893
CHECK LIST NO: QA3CH - 005
ISSUE NO: 3 PAGE 2 OF 2

SWITCHBOARD AND CONTROL PANEL
SWITCHGEAR ASSEMBLY

CUSTOMER: Brisbane Water
PROJECT: Cockie Street Pump Station WP8
CONTRACT NO: BW 43-401/02

PLANT: LOCATION / AREA: DRG NO:	TEST EQPT: VISUAL TYPE: SERIAL NO:

ITEM NO	ACTIVITY DESCRIPTION	CHECKED (TICK)	Comment
	Wiring		
17	Wire size and temperature rating is correct	(✓)	.....
18	Wire colour	(✓)	.....
19	Wire number system as per specification	(✓)	.....
20	Wire numbers	(✓)	.....
21	Isolators are correct size	(✓)	.....
22	Fuses are correct size	(✓)	.....
23	Contact/o/load are correct size	(✓)	.....
24	Terminals (allow spares as per specification)	(✓)	.....
25	Circuit breakers are correct size	(✓)	.....
			.....
	Looms		
26	Supported	(✓)	
27	Protected	(✓)	.....
28	Cable off steel edges (allow bushing)	(✓)	.....
29	Cable lugs	(✓)	.....
30	Cable crimp	(✓)	.....
			.....
			.....
			PASS

CHECKED BY: JUSTIN MULLIGAN SIGNATURE: ELECTRICAL LICENCE NO: 38779 DATE: 1/7/03	APPROVED BY: SIGNATURE: DATE: 1/7/03

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 1994, AS3000 1991 and AS3008.1 1989.

ELECTRIC

QUALITY PLAN: J06893
CHECK LIST NO: QA3CH - 010
ISSUE NO: 3 PAGE 1 OF 2

SWITCHBOARD METAL AND PAINT INSPECTION

CUSTOMER: Brisbane Water
PROJECT: Cockie Street Pump Station WP8
CONTRACT NO: BW 43-401/02

PLANT: LOCATION / AREA: DRG NO:	TEST EQPT: VISUAL. TYPE: SERIAL NO:

ITEM NO	ACTIVITY DESCRIPTION	CHECKED (TICK)	Comment
1	Check materials (eg. type and thickness)	(✓)	.....
2	Check IP rating	(✓)	.....
3	Check folds/ensure no dents	(✓)	.....
4	No gaps in join	(✓)	.....
5	Flush welds	(✓)	.....
6	No spot welds	(✓)	.....
7	Partitions in right location as per drawings	(✓)	.....
8	Position	(✓)	.....
9	Cable cut outs	(✓)	.....
10	Plynth size	(✓)	.....
11	Eye bolts	(✓)	.....
12	Hardware	(✓)	.....
13	Gland plates	(✓)	.....
14	Gland plates position	(✓)	.....
15	Doors	(✓)	.....
16	Ready to paint	(✓)	.....

CHECKED BY: CHRIS HOLMES. SIGNATURE: DATE: 16/6/03 ELECTRICAL LICENCE NO: N/A	APPROVED BY: SIGNATURE: DATE: 14/6/03.

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 1994, AS3000 1991 and AS3008.1 1989.

ELECTRIC

QUALITY PLAN: J06893
CHECK LIST NO: QA3CH - 010
ISSUE NO: 3 PAGE 2 OF 2

SWITCHBOARD METAL AND PAINT INSPECTION

CUSTOMER: Brisbane Water
PROJECT: Cockie Street Pump Station WP8
CONTRACT NO: BW 43-401/02

PLANT: LOCATION / AREA: DRG NO:	TEST EQPT: VISUAL TYPE: SERIAL NO:

ITEM NO	ACTIVITY DESCRIPTION	CHECKED (TICK)	Comment
17	Paint colour	(✓	.....
18	Paint specification	(✓	.....
19	Board assembly	(✓	.....
20	Hinges	(✓	.....
21	Door seals as per specification and drawing	(✓	.....
22	Paint inspect	(✓	.....

CHECKED BY: Chris Itamo SIGNATURE: DATE: ELECTRICAL LICENCE NO: 20/6/03.	APPROVED BY: SIGNATURE: DATE: 20/6/03.

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 1994, AS3000 1991 and AS3008.1 1989.

ELECTRIC

QUALITY PLAN: J06893
CHECK LIST NO: QA3CH - 015
ISSUE NO: 3 PAGE 1 OF 1

SWITCHBOARD AND CONTROL PANEL
INSULATION TEST TO AS3439.1-1993 (2,500 volts)

CUSTOMER: Brisbane Water
PROJECT: Cockie Street Pump Station WP8
CONTRACT NO: BW 43-401/02

PLANT: LOCATION / AREA: DRG NO:	TEST EQPT: Hi Pot/MEGGAR TYPE: KYORITSU SERIAL NO: 50200544

ITEM NO	ACTIVITY DESCRIPTION	CHECKED (TICK)	Comment
	Note: 1. 500v applied prior to 2.5kv 2. Ensure all electronics are disconnected prior to testing		
1	Rated insulation voltage	(✓)	.....
2	Disconnect control circuits and all electronics	(✓)	.....
3	Insulation test - volts	(✓)	2500V.
4	Insulation test - Red to White.	(✓)	∞
5	Insulation test - Red to Blue.	(✓)	∞
6	Insulation test - Blue to White	(✓)	∞
7	Insulation test - Red to Earth.	(✓)	∞
8	Insulation test - Red to Neutral.	(✓)	∞
9	Insulation test - White to Earth.	(✓)	∞
10	Insulation test - White to Neutral.	(✓)	∞
11	Insulation test - Blue to Earth.	(✓)	∞
12	Insulation test - Blue to Neutral.	(✓)	∞
	2.5 KV FOR 30 SEC. PTOP + PTEN + PTOE	✓	PASS.
13	Insulation test - Earth to Neutral with MEN disconnected.	(✓)	.....

CHECKED BY: JUSTIN MCCLEAN SIGNATURE: DATE: 1/7/03 ELECTRICAL LICENCE NO: 38779	APPROVED BY: SIGNATURE: DATE: 1/7/03.

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 1994, AS3000 1991 and AS3008.1 1989.

ELECTRIC

QUALITY PLAN: J06893
CHECK LIST NO: QA3CH - 020
ISSUE NO: 3 PAGE 1 OF 1

SWITCHBOARD AND CONTROL PANEL FUNCTIONAL TEST

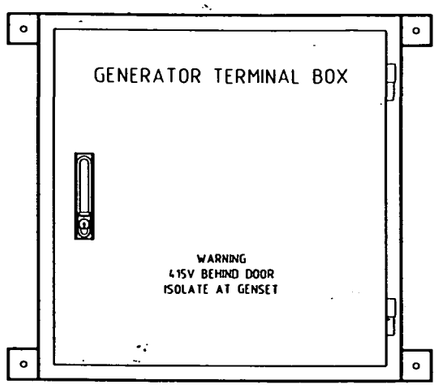
CUSTOMER: Brisbane Water
PROJECT: Cockie Street Pump Station WP8
CONTRACT NO: BW 43-401/02

PLANT: LOCATION / AREA: DRG NO:	TEST EQPT: VISUAL/MULTIMETER TYPE: FLUKE 11 SERIAL NO: 70540192.

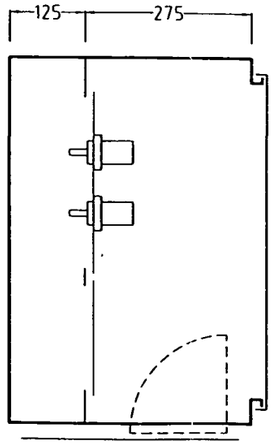
ITEM NO	ACTIVITY DESCRIPTION	CHECKED (TICK)	Comment
1	Prior to Supply Connection Do a point to point test on all cables as per the schematic drawings.(Attach copies of scematics)	(✓)	PASS
2	Check no crossed voltages 24/240.	(✓)	PASS
3	Ensure cable colour coding as per specification	(✓)	PASS.
4	Check analog inputs/outputs have shielded cable.	(✓)	PASS
5	Check all cables are numbered.	(✓)	PASS PASS
6	Ensure indicator lights have right colour lenses.	(✓)	
7	Check all CT's are earthed.	(✓)	PASS.
8	Ensure relays are switching correctly.	(—)	N/A
9	Check push buttons work correctly.	(✓)	PASS
10	Check selector switches work correctly.	(✓)	PASS.
11	Ensure signal inputs/outputs are correct.	(✓)	PASS.
12	Connect Supply Test operations step by step following specified procedure. (Refer functional test sheets)	(—)	N/A.

CHECKED BY: JUSTIN MILLIGAN SIGNATURE: DATE: 1/7/03 ELECTRICAL LICENCE NO: 36779	APPROVED BY: SIGNATURE: DATE: 1/7/03

All the above signatories certify that the Electrical switchboard work listed has been checked and tested in accordance with the prescribed procedure and that such work complies in every respect with the requirements of the Electricity Act 1994, AS3000 1991 and AS3008.1 1989.



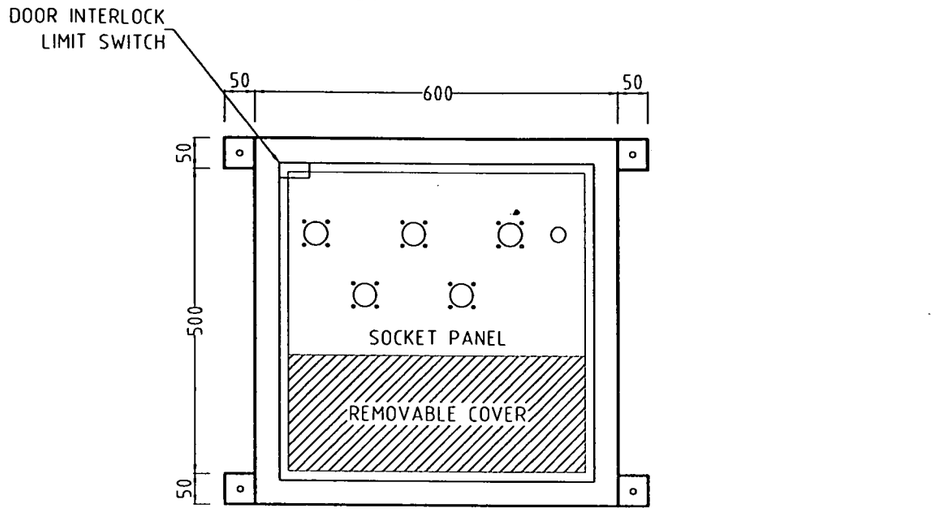
FRONT VIEW



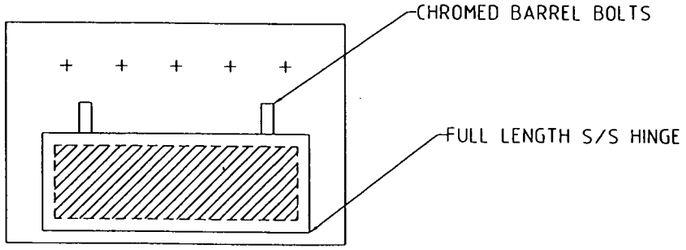
SECTIONAL VIEW

CONSTRUCTION DETAILS

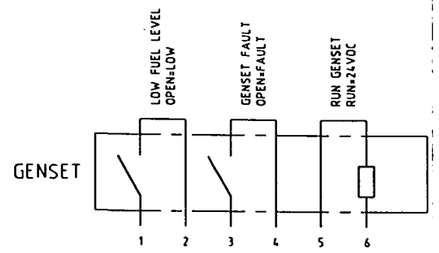
CONSTRUCTION	MACHINE FORMED AND WELDED. FRONT CONNECTED, WALL MOUNTED. ALL JOINTS TO BE CONTINUOUSLY WELDED.
MATERIAL	1.6mm MARINE GRADE STAINLESS STEEL 316 CUBICLE AND DOORS. 2.0mm ZINCANNEAL GEAR TRAYS.
FASTENERS	316 GRADE STAINLESS STEEL NUTS & BOLTS.
CABLE ENTRIES GLANDPLATES	BOTTOM ONLY AS SHOWN. 3mm ALUMINIUM WITH DUSTSEALS (UNPAINTED)
DOORS	FITTED WITH CHROME PLATED BRASS PINTLE HINGES. CHROME PLATED PADLOCKABLE SWING HANDLE S/S DOOR STAYS MIN. 120deg OPENING.
STIFFENING	ALL DOORS OVER 1000mm HIGH.
WEATHER SEALS	NEOPRENE RUBBER AROUND EACH DOOR.
SEGREGATION	FORM 1 TO AS 3439.1
PROTECTION	IP66 WEATHER PROOF
FINISH	N4
PREPARATION	CLEAN, DEGREASE AND GRIND SMOOTH
EQUIPMENT PANELS	GLOSS WHITE
LABELS	MATERIAL- ENGRAVED TRAFFOLYTE FIXING- M3 x 6 TAPTIGHTS COLOUR- W/B/W UNLESS NOTED IN SCHEDULE



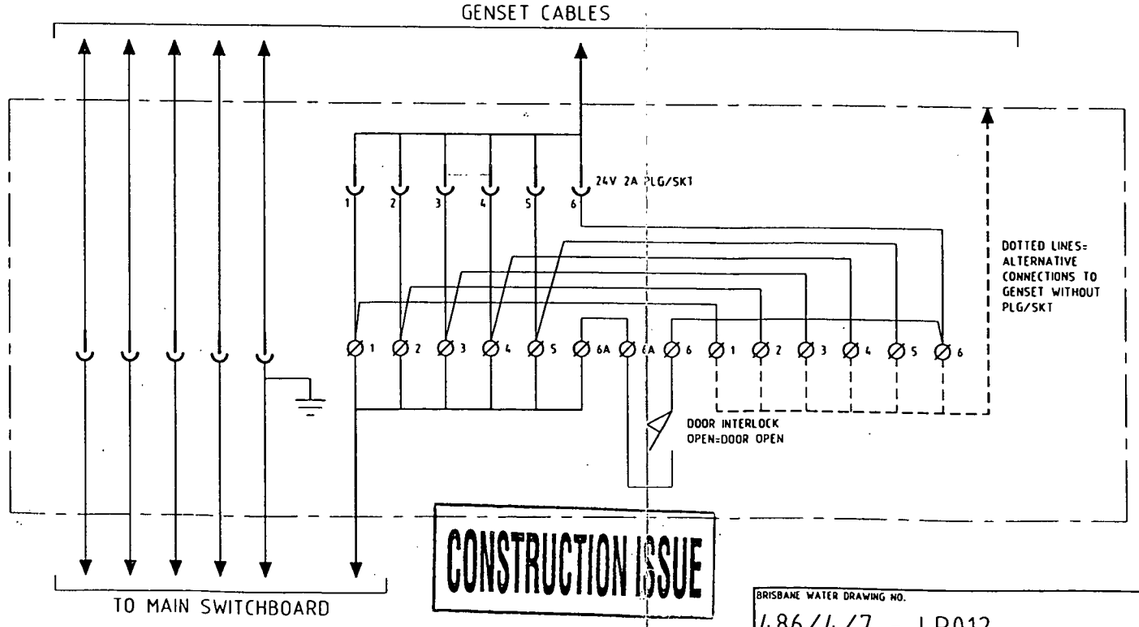
FRONT VIEW
(DOOR REMOVED)



CABLE ENTRY PLATE



GENSET CABLES



CONSTRUCTION ISSUE

REV.	DRAWN BY	DATE	CHECKED BY	DESIGNED BY	ENGINEER	APPROVED BY	REVISION TITLE
1	R.FREELAND	05-03	C.HOLMES	R.FREELAND	N.WEBER	C.HOLMES	ISSUED FOR CONSTRUCTION
0	R.FREELAND	05-03	C.HOLMES	R.FREELAND	N.WEBER	C.HOLMES	ISSUED FOR APPROVAL

CLIENT: Brisbane City — Brisbane Water

DESIGNED BY: ELECTRIC (AUST) PtyLtd
A.C.N. 011 010 807
QLD: (07) 3256 1522 VIC: (03) 9466 3977
NSW: (02) 9672 7922 WA: (08) 9470 4292

TITLE: COCKLE ST PUMP STATION WP08
GENERATOR CONNECTION BOX
GENERAL ARRANGEMENT

BRISBANE WATER DRAWING NO.: 486/4/7 - LR012

DRAWING NO.: 06893-E-002 — SHEET: A3

SCALE: N.T.S. — SHEET 1 OF 1

OFFICE: QUEENSLAND — FILENAME: 06893e002

STANDARD DESIGNATION A3 - 420 x 297mm

Brisbane City

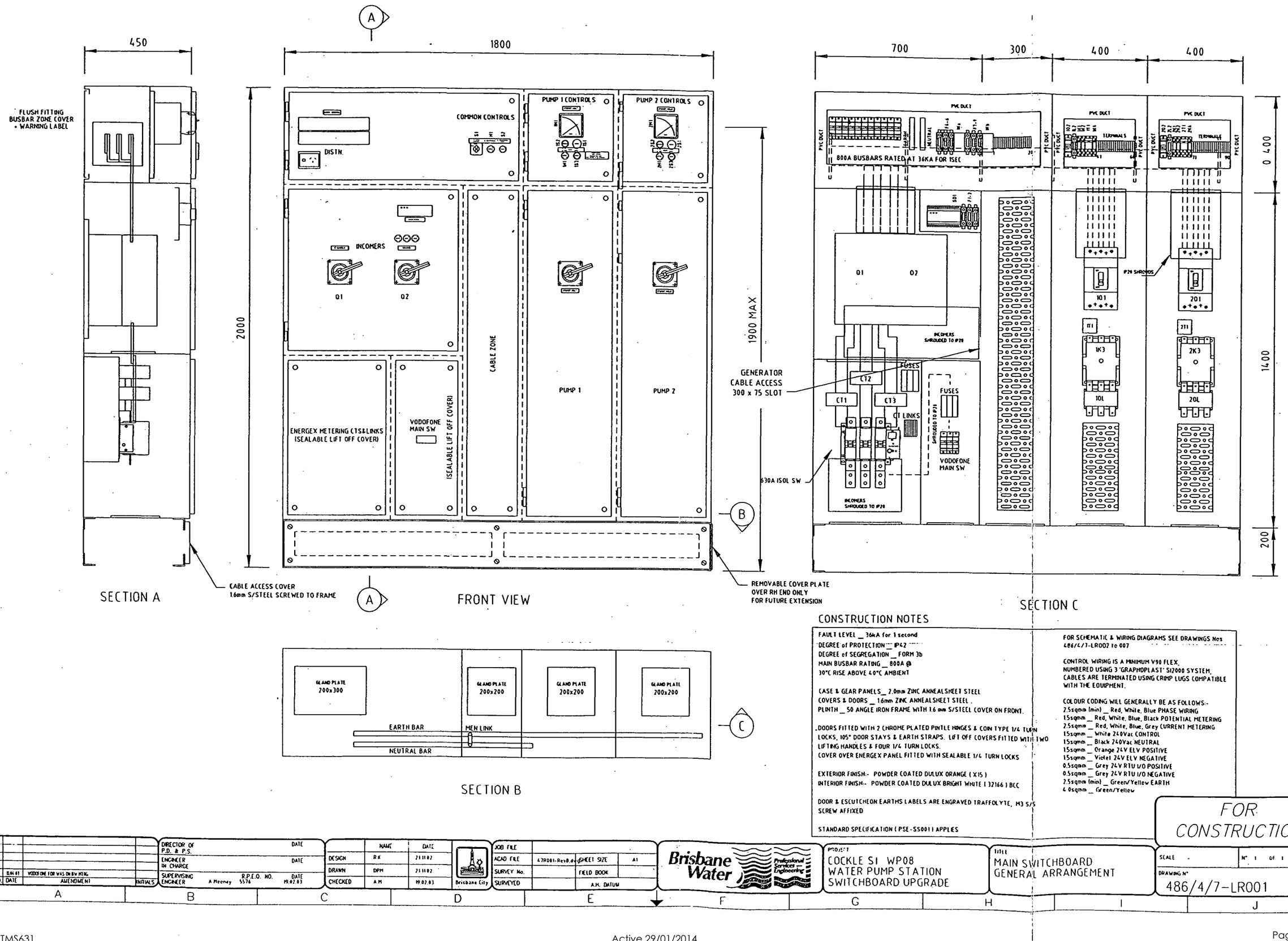
Brisbane Water

COCKLE STREET WATER PUMP STATION WP08 SWITCHBOARD UPGRADE ELECTRICAL DRAWINGS

ELECTRICAL DRAWING LIST

DWG N°.	TITLE
486/4/7-LR000	DRAWING INDEX
486/4/7-LR001	SWITCHBOARD GENERAL ARRANGEMENT
486/4/7-LR002	SINGLE LINE DIAGRAM
486/4/7-LR003	INCOMERS SCHEMATIC
486/4/7-LR004	INCOMERS & COMMON CONTROLS SCHEMATIC
486/4/7-LR005	PUMP No.1 SCHEMATIC
486/4/7-LR006	PUMP No.2 SCHEMATIC
486/4/7-LR007	CONTROL TERMINATIONS DIAGRAM
486/4/7-LR008	AREA LAYOUT
486/4/7-LR009	GENERATOR TERMINAL BOX DETAILS

CADD FILE 47LR000 | SUPERVISING ENGINEERS
JOB FILE | N° 1 OF 1 SHEETS
DRAWING N° 486/4/7-LR000 | AMEND O



CONSTRUCTION NOTES

FAULT LEVEL _ 36kA for 1 second
DEGREE of PROTECTION _ IP42
DEGREE of SEGREGATION _ FORM 3b
MAIN BUSBAR RATING _ 800A @ 30°C RISE ABOVE 40°C AMBIENT

CASE & GEAR PANELS _ 2.0mm ZINC ANNEALSHEET STEEL
COVERS & DOORS _ 1.6mm ZINC ANNEALSHEET STEEL.
PLINTH _ 50 ANGLE IRON FRAME WITH 1.6 mm S/STEEL COVER ON FRONT.

DOORS FITTED WITH 2 CHROME PLATED PINTLE HINGES & COIN TYPE 1/4 TURN LOCKS, 105° DOOR STAYS & EARTH STRAPS. LIFT OFF COVERS FITTED WITH TWO LIFTING HANDLES & FOUR 1/4 TURN LOCKS.
COVER OVER ENERGEX PANEL FITTED WITH SEALABLE 1/4 TURN LOCKS

EXTERIOR FINISH:- POWDER COATED DULUX ORANGE (X15)
INTERIOR FINISH:- POWDER COATED DULUX BRIGHT WHITE (32166) BCC

DOOR & ESCUTCHEON EARTHS LABELS ARE ENGRAVED TRAFFOLYTE, M3 S/S SCREW AFFIXED

STANDARD SPECIFICATION (PSE-SS001) APPLIES

FOR SCHEMATIC & WIRING DIAGRAMS SEE DRAWINGS Nos 486/4/7-LR002 to 007

CONTROL WIRING IS A MINIMUM V90 FLEX, NUMBERED USING 3 'GRAPHOPLAST' SI2000 SYSTEM. CABLES ARE TERMINATED USING CRIMP LUGS COMPATIBLE WITH THE EQUIPMENT.

COLOUR CODING WILL GENERALLY BE AS FOLLOWS:-
2.5sqmm (min) _ Red, White, Blue PHASE WIRING
1.5sqmm _ Red, White, Blue, Black POTENTIAL METERING
2.5sqmm _ Red, White, Blue, Grey CURRENT METERING
1.5sqmm _ White 240Vac CONTROL
1.5sqmm _ Black 240Vac NEUTRAL
1.5sqmm _ Orange 24V ELV POSITIVE
1.5sqmm _ Violet 24V ELV NEGATIVE
0.5sqmm _ Grey 24V RTU I/O POSITIVE
0.5sqmm _ Grey 24V RTU I/O NEGATIVE
2.5sqmm (min) _ Green/Yellow EARTH
4.0sqmm _ Green/Yellow

FOR CONSTRUCTION

NO.	DATE	AMENDMENT	INITIALS
B	11.04.03	VODAFONE FOR WAS ON BUSWIRING	

		NAME	DATE
DIRECTOR OF P.D. & P.S.	DATE		
ENGINEER IN CHARGE	DATE		
SUPERVISING ENGINEER	A Mooney R.P.E.Q. NO. 5576 DATE 19.02.03	DESIGN	RK 21.11.02
		DRAWN	DPM 21.11.02
		CHECKED	AM 19.02.03

Brisbane City

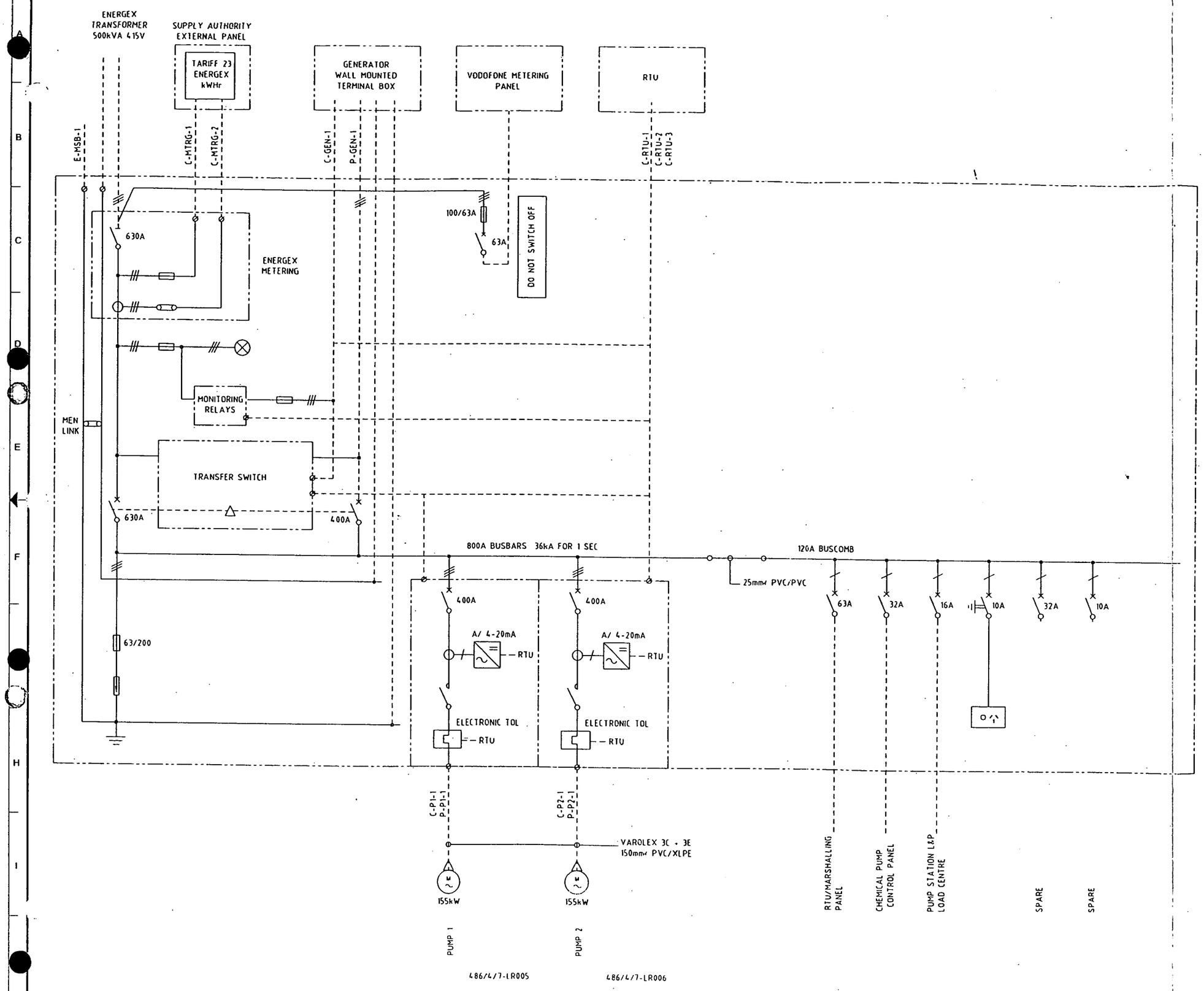
JOB FILE			
ACAD FILE	478081-Rev8.dwg	SHEET SIZE	A1
SURVEY No.		FIELD BOOK	
SURVEYED		A.H. DATUM	

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE ST WP08
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
GENERAL ARRANGEMENT

SCALE -
N° 1 OF 1 SHEETS
DRAWING N° 486/4/7-LR001
AMEND B



ISSUED FOR CONSTRUCTION

No	DATE	AMENDMENT	INITIALS
A	11.04.03	VODOFONE FDR WAS ON BW MTRG	

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Mooney 5596 — DATE 2/03

JOB FILE — CAD FILE 47LR002-RevA.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK		
DRAWN	DPM	21.11.02
DRAFTING CHECK	R.K.	01/03

Brisbane City

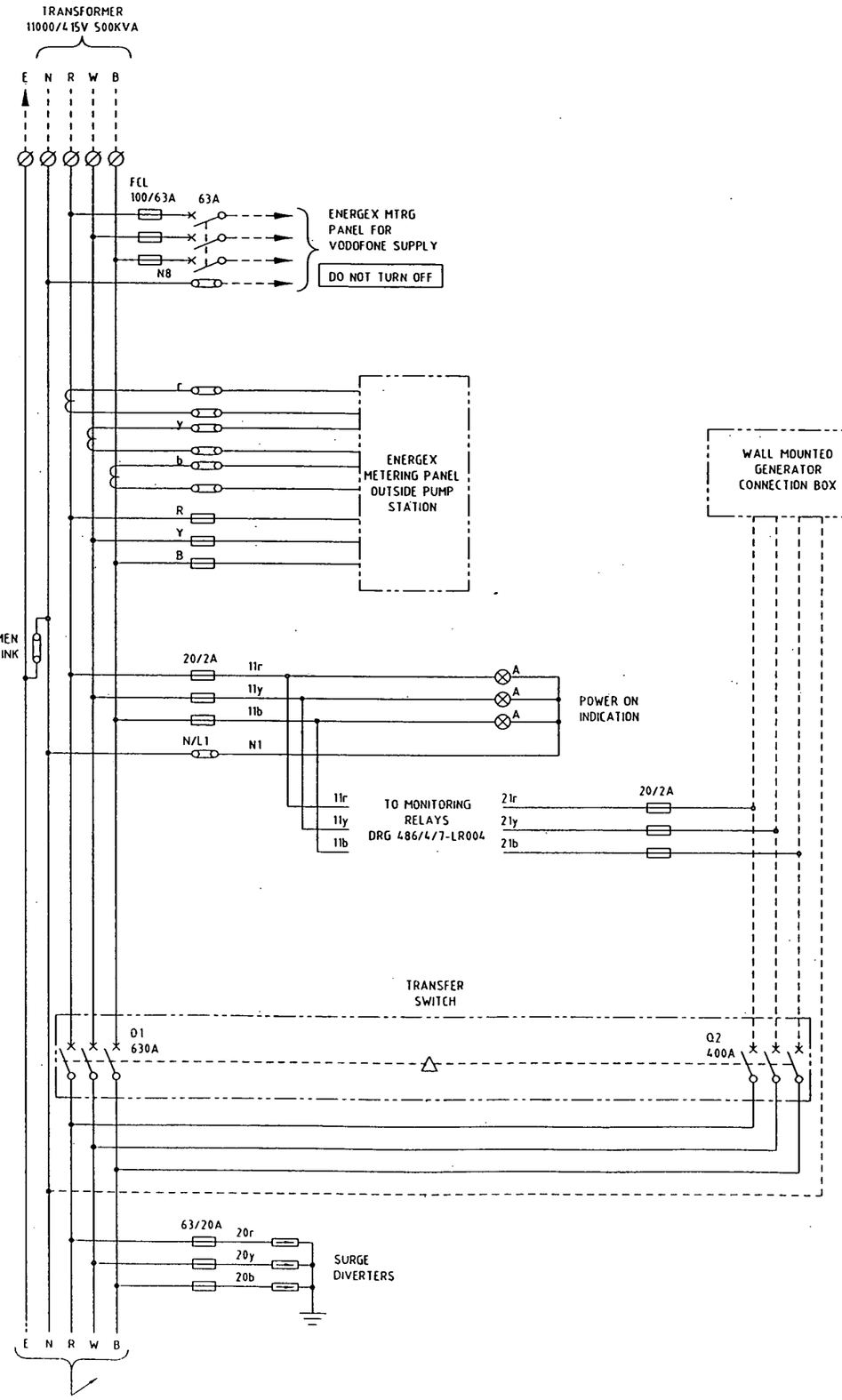
Brisbane Water — Professional Services — Engineering

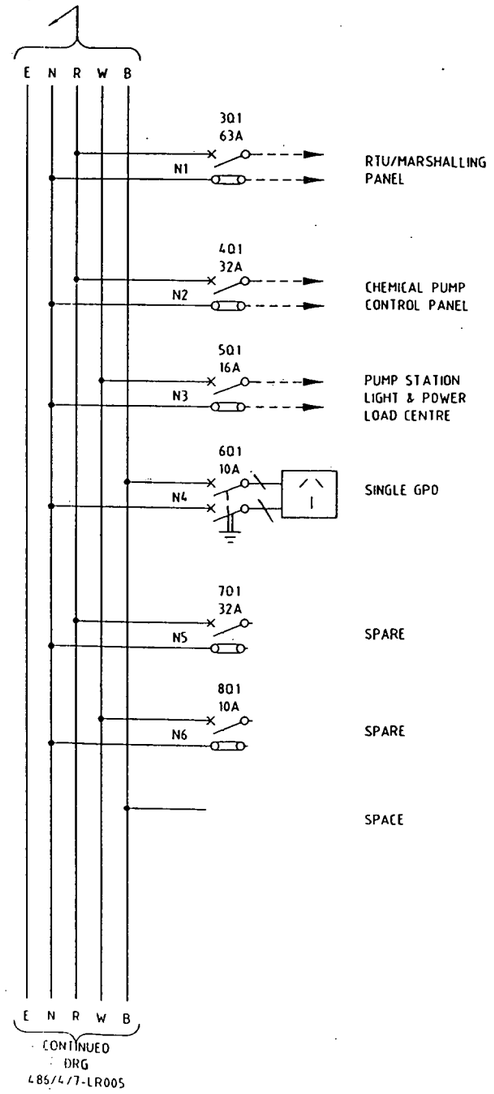
PROJECT
COCKLE STREET WP08
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
SINGLE LINE DIAGRAM

SCALE - | A.H. DATUM | N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR002 | AMEND. A





ISSUED FOR CONSTRUCTION

No	DATE	AMENDMENT	INITIALS
A	11.04.03	VODOFONE FDR WAS ON BW MTRG	

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Money 5596 — DATE 2/03

JOB FILE — CAD FILE 47LR003-RevA.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK		
DRAWN	DPM	21.11.02
DRAFTING CHECK	R.K.	01/03

Brisbane City

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP08
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
INCOMERS
SCHEMATIC DIAGRAM

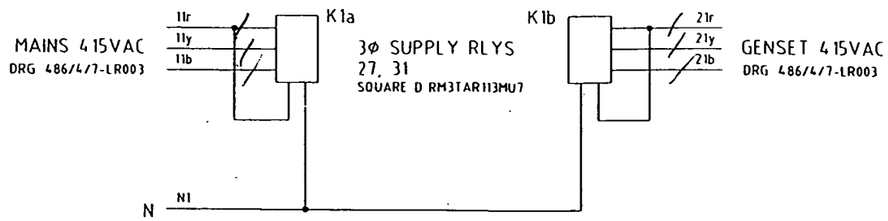
SCALE -

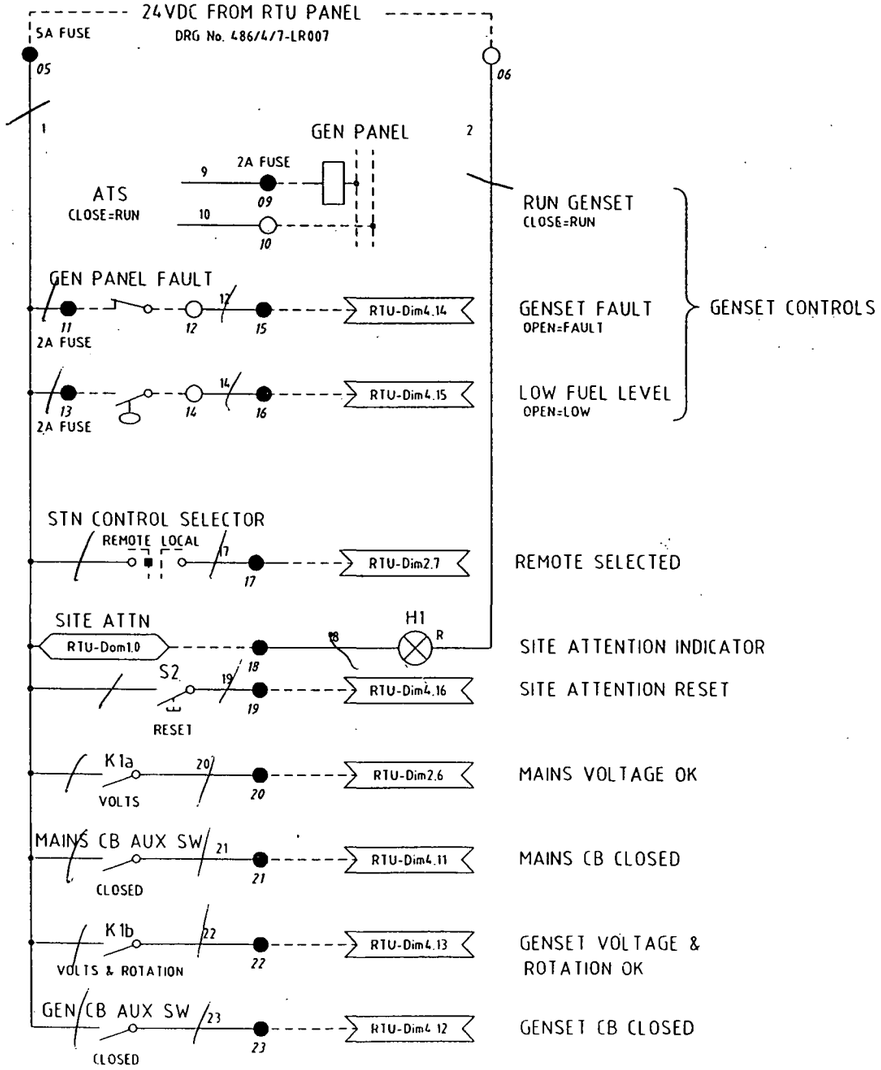
A.H. DATUM

N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR003

AMEND. A





SYMBOLS LEGEND

- ???-?I??? = INPUT
- ???-?O??? = OUTPUT
  - = I/O ADDRESS
  - A=ANALOG, D=DIGITAL
  - RTU=REMOTE TERMINATION UNIT, PCR=PROGRAMABLE CONTROL RELAY
- (P1-XX) = EXTERNAL WIRING
- ● = FUSED TERMINALS (0.1A U.N.O.)
- ○ = LINK TERMINALS

ISSUED FOR CONSTRUCTION

No	DATE	AMENDMENT	INITIALS
A	11.04.03	ISSUED FOR CONSTRUCTION	

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Money 5596 — DATE 2/03

JOB FILE — CAD FILE 47LR004-RevA.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK		
DRAWN	DPM	21.11.02
DRAFTING CHECK		

Brisbane City

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP08
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
INCOMERS & COMMON CONTROLS
SCHEMATIC DIAGRAM

SCALE -

A.H. DATUM

N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR004

AMEND. A

CONTINUED FROM 486/4/7-LR003

E N R W B

101 — 400A (PADLOCKABLE)

1T1

1K3

10/L

PUMP 1
155kW
FLC 267A

31

54, 55 — A — 53 — 0-400A

RTU-Aim2.6

MOTOR CURRENT
4 - 20mA

NOT USED

5Amps

41 — 24VDC FROM RTU PANEL (ORG No. 486/4/7-LR007) — 42

24VDC5A SUPPLY

2A 102

101r

1K1

CONTROL SUPPLY OK RELAY

45 — RTU-Dim2.9

CONTROL SUPPLY OK

19L

46 — RTU-Dim2.14

SWBD LOCKOUT STOP PB

RUN PUMP — RTU-Dom1.5 — 47

1K2

RUN RELAY
22, 23

1S1 — 47D — 47C — REMOTE LOCAL — S1 — STN CONTROL SELECTOR — 47B — 1S2 — 47A — START

OPENS ON DELAY

1K2

1T1

FLOW FAIL TIMER
20

102r — STOP — 103r — 1K3

RUN CONTACTOR
3,4,5, 25

1L2 — N102

48 — RTU-Dim2.8

RUN CONTACTOR ON

STATUS — RTU-Dom1.6 — 49

1H1

STATUS

1K4

FLOW OK RELAY
22

REFLUX VALVE POSITION — 43 — OPEN=NO FLOW — 44

50 — RTU-Dim2.10

REFLUX VALVE OPEN

51 — RTU-Dim2.11

MOTOR OVERLOAD TRIP

1S3 — RESET — 52 — RTU-Dim2.13

FAULT RESET

E N R W B

CONTINUED ON 486/4/7-LR006

SYMBOLS LEGEND

- ???-?I??? = INPUT
- ???-?O??? = OUTPUT
  - = I/O ADDRESS
  - A=ANALOG, D=DIGITAL
  - RTU=REMOTE TERMINATION UNIT, PCR=PROGRAMABLE CONTROL RELAY
- CP1-XX = EXTERNAL WIRING
- ● = FUSED TERMINALS (0.1A U.N.O.)
- ○ = LINK TERMINALS

ISSUED FOR CONSTRUCTION

No	DATE	AMENDMENT	INITIALS
A	11.04.03	ISSUED FOR CONSTRUCTION	

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Money 5596 — DATE 2/03

JOB FILE — CAD FILE 47LR005-RevA.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK		
DRAWN	DPM	21.11.02
DRAFTING CHECK		

Brisbane City

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP08
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
PUMP No.1
SCHEMATIC DIAGRAM

SCALE -

A.H. DATUM

N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR005

AMEND. A

CONTINUED FROM 486/4/7-LR003

E N R W B

201 — 400A (PADLOCKABLE)

2T1

2K3

20/L — 31

M — PUMP 2, 155kW, FLC 267A

A — 0-400A — 84, 85, 83 — RTU-Aim2.7 — MOTOR CURRENT 4 - 20mA

NOT USED

5Amps — 71 — 24VDC FROM RTU PANEL DRG No. 486/4/7-LR007 — 72 — 24VDC5A SUPPLY

2A 202 — 201r — 2K1 — CONTROL SUPPLY OK RELAY

RTU-Dim3.9 — 75 — CONTROL SUPPLY OK

20L — RTU-Dim3.14 — 76 — SWBD LOCKOUT STOP PB

RUN PUMP — RTU-Dom1.7 — 77 — 2K2 — RUN RELAY 22, 23

REMOTE LOCAL — 2S1 — 2S2 — START — OPENS ON DELAY

S1 STN CONTROL SELECTOR

2K2 — 2T1 — FLOW FAIL TIMER 20

202r — 203r — 2K3 — RUN CONTACTOR 3,4,5, 25

STOP

2L2 N202

78 — RTU-Dim3.8 — RUN CONTACTOR ON

STATUS — RTU-Dom1.8 — 79 — 2H1 — STATUS

2K4 — FLOW OK RELAY 22

REFLUX VALVE POSITION — 73 — OPEN=NO FLOW — 74 — RTU-Dim3.10 — 80 — REFLUX VALVE OPEN

81 — RTU-Dim3.11 — 91 — MOTOR OVERLOAD TRIP

2S3 — RESET — 82 — RTU-Dim3.12 — 92 — FAULT RESET

CONTINUED ON 486/4/7-LR006

SYMBOLS LEGEND

- ???-?I??? = INPUT
- ???-?O??? = OUTPUT
  - = I/O ADDRESS
  - A=ANALOG, D=DIGITAL
  - RTU=REMOTE TERMINATION UNIT, PCR=PROGRAMABLE CONTROL RELAY
- CP1-XX = EXTERNAL WIRING
- ● = FUSED TERMINALS (0.1A U.N.O)
- ○ = LINK TERMINALS

ISSUED FOR CONSTRUCTION

No	DATE	AMENDMENT	INITIALS
A	11.04.03	ISSUED FOR CONSTRUCTION	

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. A Money 5596 — DATE 2/03

JOB FILE — CAD FILE 47LR006-RevA.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK		
DRAWN	DPM	21.11.02
DRAFTING CHECK		

Brisbane City

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP08
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
PUMP No.2
SCHEMATIC DIAGRAM

SCALE -

A.H. DATUM

N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR006

AMEND. A

COMMON CONTROL SECTION

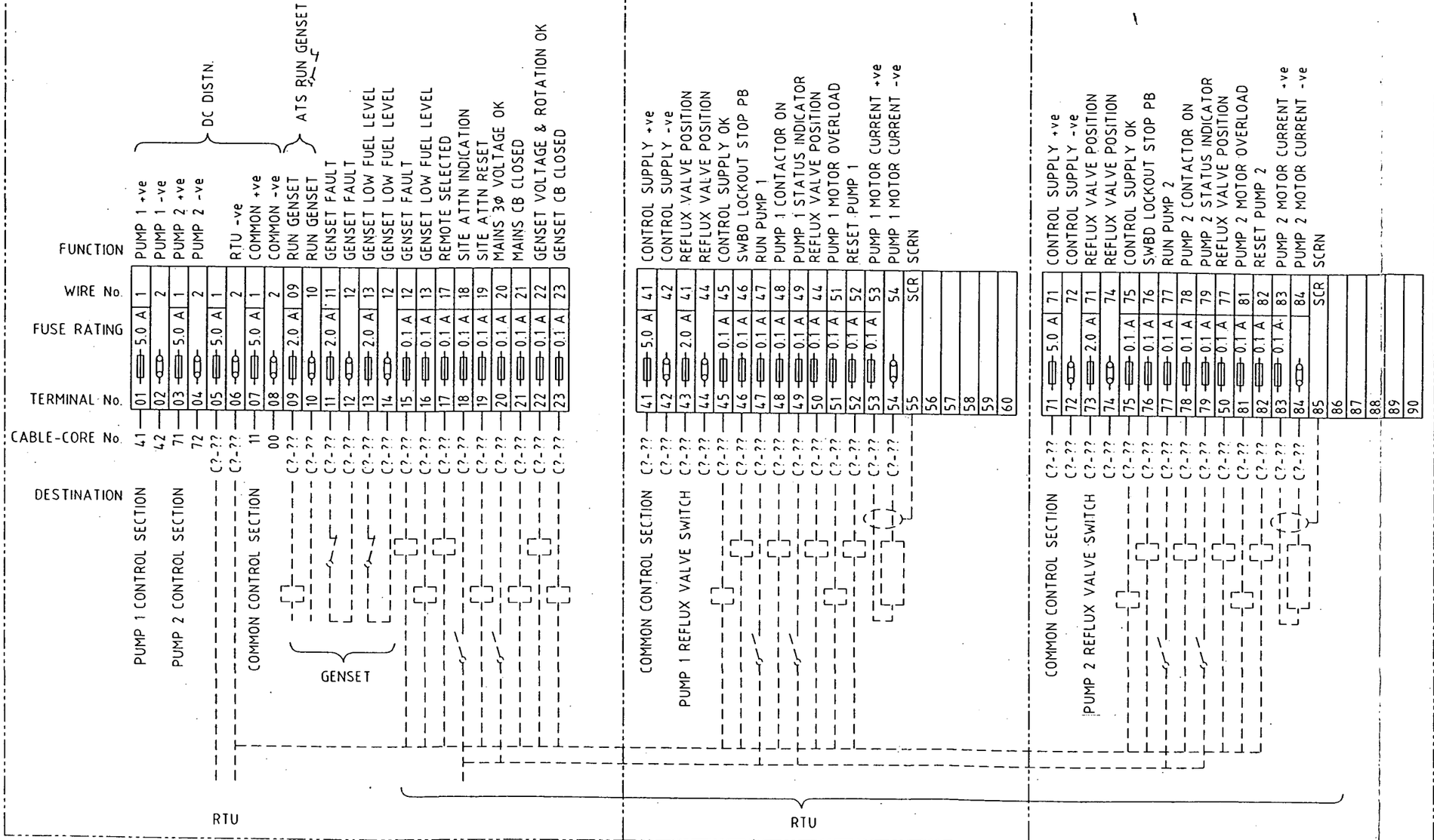
REFER DRG. 486/4/7-LR004

PUMP 1 CONTROL SECTION

REFER DRG. 486/4/7-LR005

PUMP 2 CONTROL SECTION

REFER DRG. 486/4/7-LR006



ISSUED FOR CONSTRUCTION

No.	DATE	AMENDMENT	INITIALS

MANAGER OF URBAN MANAGEMENT — DATE

MANAGER OF BUSINESS ASSET SERVICES — DATE

MANAGER PROFESSIONAL SERVICES - ENGINEERING — DATE

SUPERVISING ENGINEER — R.P.E.Q. NO. — DATE

JOB FILE — CAD FILE 47LR007-RevA.dwg

DESIGN	R.K.	21.11.02
DESIGN CHECK		
DRAWN	DPM	21.11.02
DRAFTING CHECK		

Brisbane City

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE STREET WP08
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
MAIN SWITCHBOARD
CONTROL TERMINATIONS

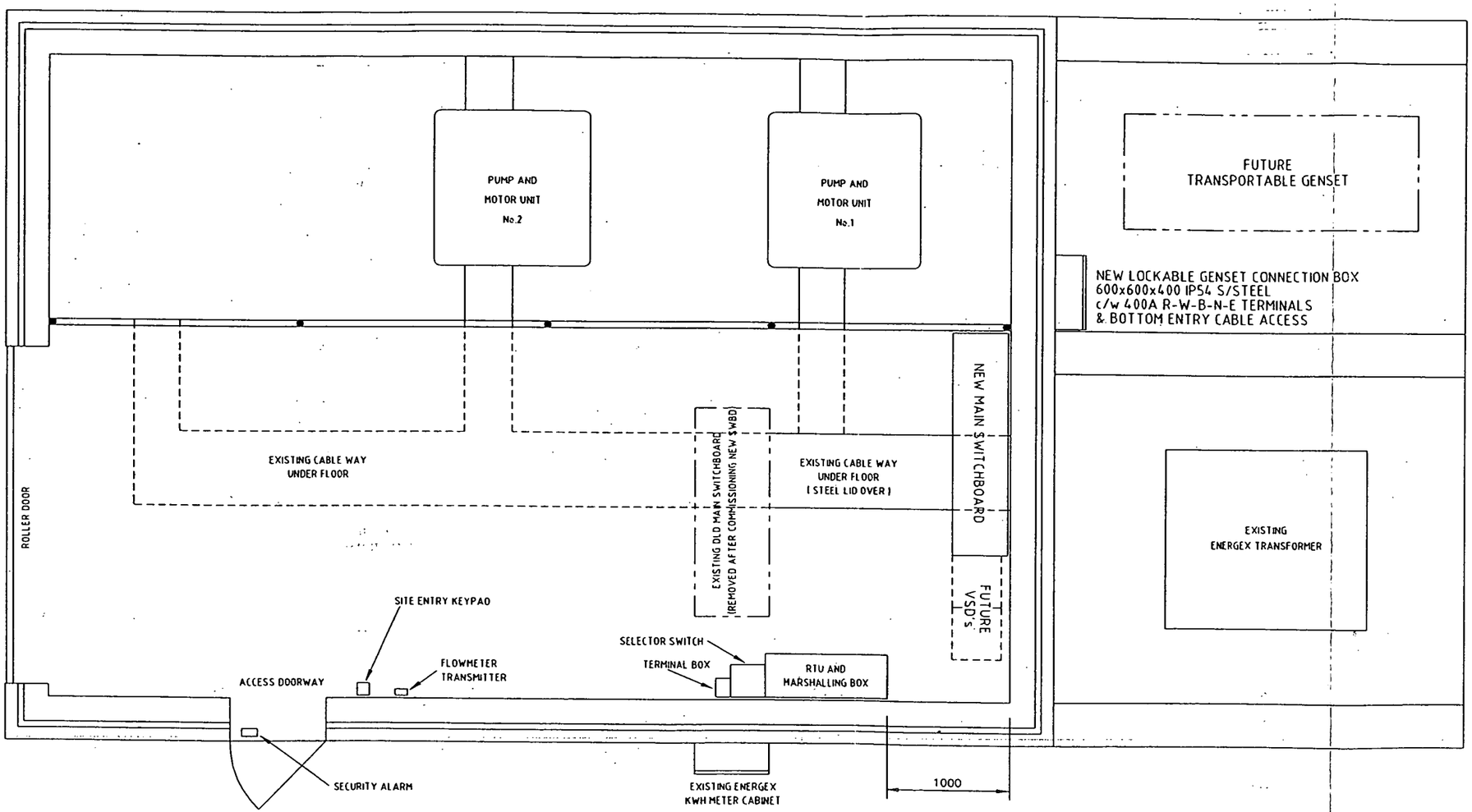
SCALE -

A.H. DATUM

N° 1 OF 1 SHEETS

DRAWING N°
486/4/7-LR007

AMEND.
A



PLAN

ISSUED FOR CONSTRUCTION

NO.	DATE	AMENDMENT	INITIALS
A	27.11.03	ISSUED FOR CONSTRUCTION	

DIRECTOR OF P.D. & P.S. DATE
ENGINEER IN CHARGE DATE
SUPERVISING ENGINEER R.P.E.Q. NO. DATE

	NAME	DATE
DESIGN	R.K	21.11.02
DRAWN	D.P.M	21.11.02
CHECKED		

Brisbane City

JOB FILE			
ACAD FILE	47LR005-RevA.dwg	SHEET SIZE	A1
SURVEY No.		FIELD BOOK	
SURVEYED		A.H. DATUM	

Brisbane Water

PROJECT: COCKLE ST WP08 WATER PUMP STATION SWITCHBOARD UPGRADE

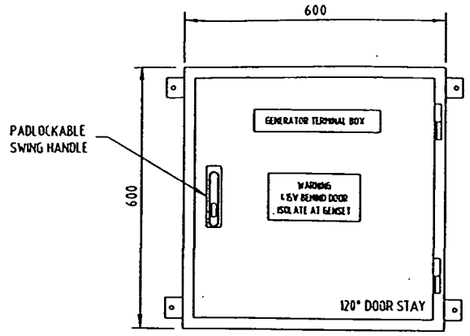
TITLE: MAIN SWITCHBOARD AREA LAYOUT

SCALE -

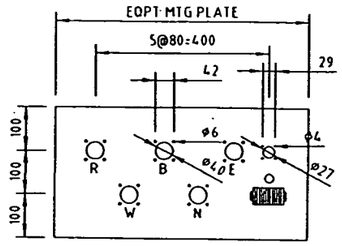
N° 1 OF 1 SHEETS

DRAWING N° 486/4/7-LR008

AMEND A

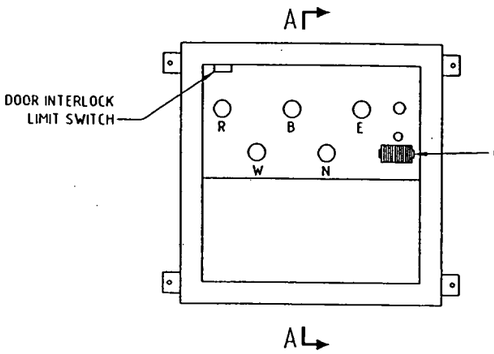


FRONT VIEW

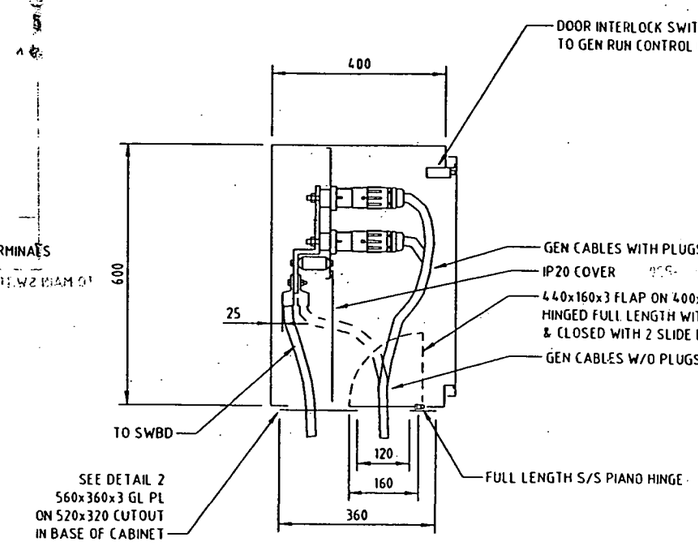


DETAIL 1

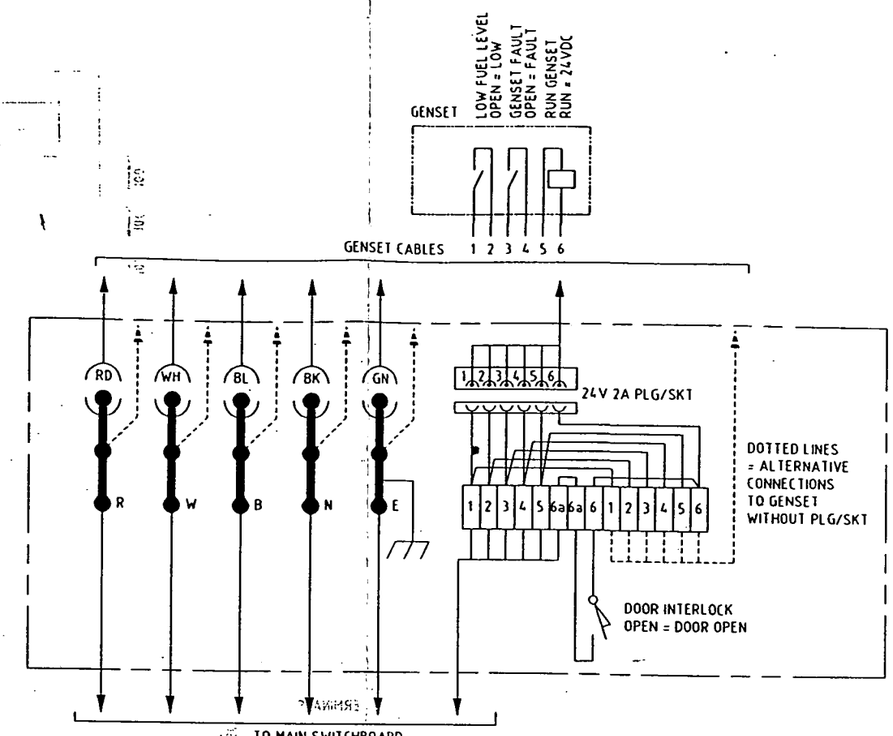
SOCKET PANEL - 2mm SM (PART OF EQPT MTG PL)

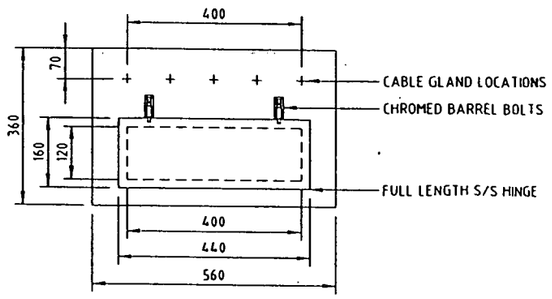


FRONT ELEVATION



SECTION A-A





DETAIL 2

CABLE ENTRY PLATE

NOTES

1. ENCLOSURE = B&R 21214/S OR EQUAL
   1.6mm s/s IP66
   C/W PADLOCKABLE SWING HANDLE &
   INTERNAL EQUIPMENT PLATE & MTG. KIT
   & MEB/S WALL MTG BKTS.

2. BASE OF CUBICLE TO BE CUTOUT 520x320
   FOR 560x360x3mm ALUMINUM CABLE ENTRY PLATE

3. FLAP ON CABLE ENTRY PLATE TO BE 1.6mmS/S
   HINGED ALONG LONG EDGE AND HELD CLOSED
   WITH 2 CHROME PLATED BARREL BOLTS

NO	DATE	AMENDMENT	INITIALS
B	[illegible]	BOX MODIFIED CONSTRUCTION ISSUE	

DIRECTOR OF P.D. & P.S. — DATE
ENGINEER IN CHARGE — DATE
SUPERVISING ENGINEER — R.P.E.Q. [illegible] A.Mackey 5579 — DATE 01/03

	NAME	DATE
DESIGN	RK	21.11.02
DRAWN	DPM	21.11.02
CHECKED		

Brisbane City

JOB FILE	
ACAD FILE	47R009-RevB.dwg
SURVEY No.	
SURVEYED	
SHEET SIZE	A1
FIELD BOOK	
A.H. DATUM	

Brisbane Water — Professional Services — Engineering

PROJECT
COCKLE ST WP08
WATER PUMP STATION
SWITCHBOARD UPGRADE

TITLE
GENERATOR CONNECTION BOX
GENERAL ARRANGEMENT

SCALE - | N° 1 OF 1 SHEETS
DRAWING N° 486/4/7-LR009 | AMEND B

ISSUED FOR CONSTRUCTION