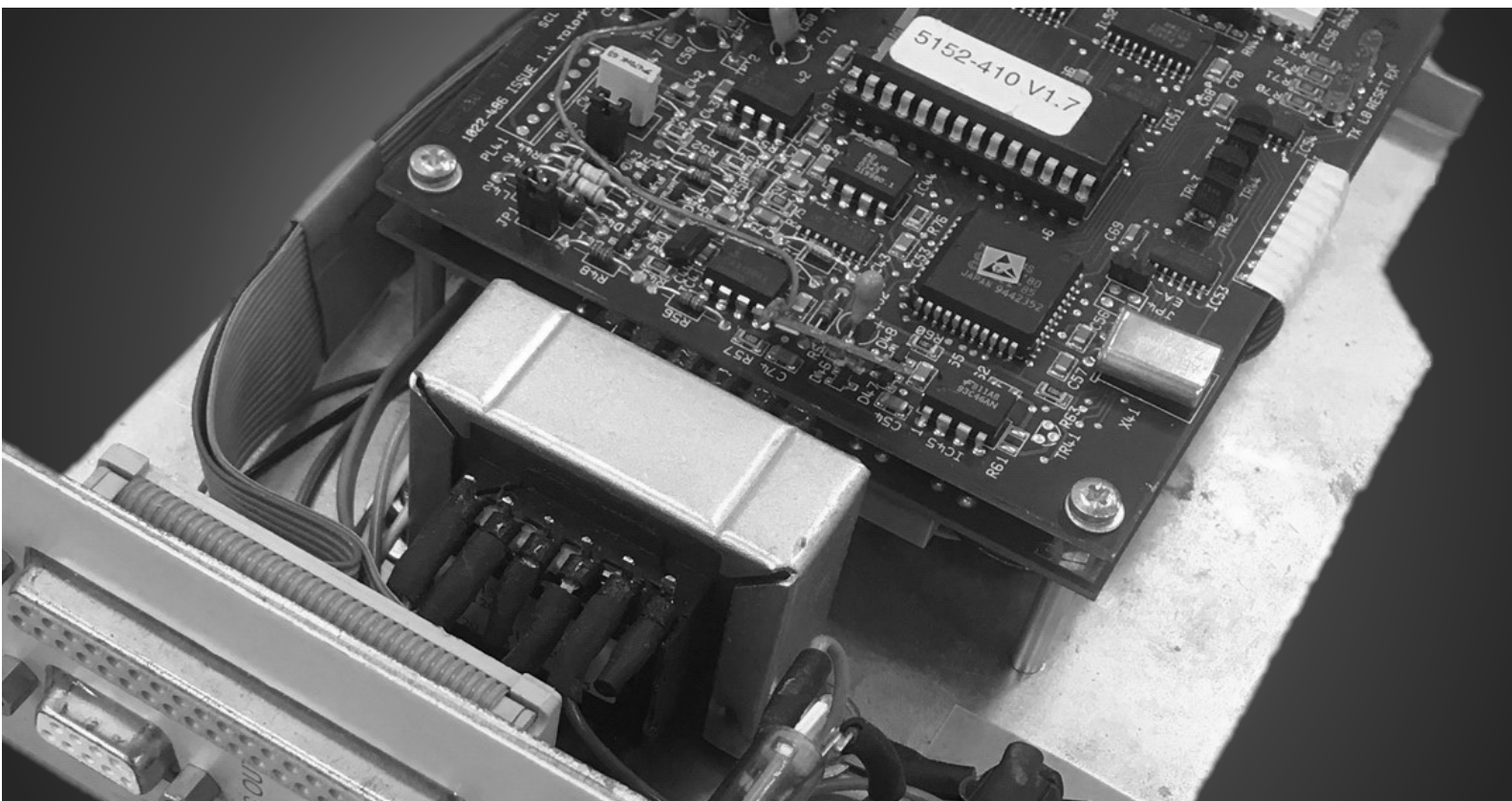


# rotork<sup>®</sup>

Keeping the World Flowing  
for Future Generations

## General Purpose Field Control Unit Brochure



**Pakscan<sup>™</sup>**

# TABLE OF CONTENTS

<b>INTRODUCTION .....</b>	<b>4</b>
<b>PERFORMANCE SPECIFICATION .....</b>	<b>5</b>
<i>Pakscan 2 -Wire Interface.....</i>	<i>5</i>
<i>Eight Digital Inputs .....</i>	<i>5</i>
<i>Four Digital Outputs .....</i>	<i>5</i>
<i>Two Analogue Inputs.....</i>	<i>5</i>
<i>One Analogue Output.....</i>	<i>5</i>
<i>Electrical Supply .....</i>	<i>5</i>
<b>INPUT / OUTPUT DESCRIPTION .....</b>	<b>6</b>
GENERAL PURPOSE MODE .....	6
<i>Alarms.....</i>	<i>6</i>
ACTUATOR MODE .....	6
<i>Digital control.....</i>	<i>6</i>
<i>Position control .....</i>	<i>6</i>
<i>Digital feedback.....</i>	<i>6</i>
<i>Analogue feedback.....</i>	<i>6</i>
<i>Alarms.....</i>	<i>6</i>
<i>Derived alarms .....</i>	<i>6</i>
<b>EXPLOSIONPROOF – FLP-PB2.....</b>	<b>7</b>
<i>Enclosure.....</i>	<i>7</i>
<i>Approvals .....</i>	<i>7</i>
<i>Alternative Approvals .....</i>	<i>7</i>
<i>Terminals .....</i>	<i>7</i>
<i>Conduit entries .....</i>	<i>7</i>
<i>Environmental specification.....</i>	<i>7</i>
<i>Ordering Details .....</i>	<i>7</i>
<i>Ordering Example.....</i>	<i>8</i>
<i>Wiring Connection Details .....</i>	<i>9</i>
<b>WEATHERPROOF – WP-PB2.....</b>	<b>10</b>
<i>Enclosure.....</i>	<i>10</i>
<i>Terminals .....</i>	<i>10</i>
<i>Conduit entries .....</i>	<i>10</i>
<i>Environmental specification.....</i>	<i>10</i>
<i>Ordering Details .....</i>	<i>10</i>
<i>Ordering Example.....</i>	<i>11</i>
<i>Wiring Connection Details .....</i>	<i>11</i>

<b>PANEL MOUNTED – PM-PB2.....</b>	<b>12</b>
<i>Enclosure.....</i>	<i>12</i>
<i>Terminals .....</i>	<i>12</i>
<i>Conduit entries .....</i>	<i>12</i>
<i>Environmental specification.....</i>	<i>12</i>
<i>Ordering Details .....</i>	<i>12</i>
<i>Ordering Example.....</i>	<i>13</i>
<i>Wiring Connection Details .....</i>	<i>13</i>
<b>RACK MOUNTED – RACK-PB2 .....</b>	<b>14</b>
<i>Enclosure.....</i>	<i>14</i>
<i>Connections.....</i>	<i>14</i>
<i>Environmental specification.....</i>	<i>14</i>
<i>Ordering Details .....</i>	<i>14</i>

# INTRODUCTION

The Pakscan General Purpose Field Control Unit (GPFCU) provides a means of controlling actuators, pumps, motors, solenoid valves, mixers, etc., as well as interfacing digital and analogue information between field process devices and a Pakscan two-wire control system. By using a Pakbox housing, the GPFCU can be field mounted in non-hazardous or hazardous areas and may often be placed close to the device being controlled or monitored.

The range of Pakbox enclosures provides a variety of enclosure protection, conduit entries and installation locations to ensure easy integration into the site process.

## Pakscan™ CLASSIC

- Long loop length, up to 20 km
- Redundant, single fault tolerant, loop
- High noise immunity, current loop
- Up to 240 field devices, on a single highway
- No external repeaters, highway terminators or biasing
- Open to third party devices
- Fast scan time due to 'report by exception' protocol
- Standard instrumentation cable

The Pakscan redundant loop network has been the network of choice for actuator control for over 30 years. Using robust current loop technology, up to 20 km loop lengths and 240 field devices are possible.

Redundant loop ensures plant operability in the event of cable break or earth fault. Each field control unit has loopback circuitry that switches in the event of a fault providing continued loop connection on the 2-wire system. Current loop technology provides high noise immunity.

Standard low cost twisted pair instrumentation cable (one pair) is required for the network loop and there are no requirements for external repeaters or network termination.

Utilising 'Report by Exception', provides efficient data reporting at low baud rates required for long distance current loop communications. Up to 20 km loop lengths and the control and monitoring of up to 240 devices are possible with no limitation on the distance between devices.

Actuators can be used as a hub or a dedicated General Purpose Field Control Unit (GPFCU) can also be used as digital and analogue I/O, providing the interfaces to connect other actuator types and additional plant control devices into the network.



## PERFORMANCE SPECIFICATION



### Pakscan 2 -Wire Interface

Baud Rate	2400, 1200, 600, 300 or 110
Current	20 mA
Conductors	Screened twisted pair

### Eight Digital Inputs

Isolation	Mutual galvanic isolation
Input Voltage	Active: $18\text{ V} < V_i < 38\text{ V}$ Inactive: $-0.5\text{ V} < V_i < 2\text{ V}$
Pulse Input	Input 1
Pulse Width	$> 20\text{ ms}$
I/P power supply	Internal 24 V at 20 mA max

### Four Digital Outputs

Contacts	Changeover
Operation	Fleeting or maintained (normally de-energised)
Voltage range	Up to 120 V
Maximum load	60 W, 125 VA, 1 A
Life	$10^7$ operations at 5 W load

### Two Analogue Inputs

Range	0 - 5 V or 4 - 20 mA
Resolution	1.2 mV
Thermal stability	100 ppm/°C

### One Analogue Output

Voltage range	0 - 5 V
Resolution	1.2 mV
Thermal stability	100 ppm/°C
Load resistance	$> 1\text{ k}\Omega$

### Electrical Supply

Supply	110 VAC $\pm 20\%$ 230 VAC $+10\%/-20\%$ 47 - 63 Hz
--------	---

# INPUT / OUTPUT DESCRIPTION

## General Purpose Mode

Eight independent digital inputs, each suitable for use with a volt-free contact and the GPFCU 24V. Each input can be configured to invert the incoming signal. Input D1 also acts as a pulse counter up to 9,999 where one pulse is greater than 20 ms. The state of the digital outputs and their action (fleeting or maintained) is reported, as are status bits relating to the field unit itself.

Four digital outputs, each with one independently addressable changeover contact rated at 60 W, 125 VA, 1 A. All contacts can be fleeting (300 ms) or maintained (requiring an energise and de-energise command).

Two analogue inputs sharing a common. Both inputs must be configured to 4 - 20 mA or 0 - 5 V. Reported on the Pakscan network as a percentage value 0% - 100%. Current inputs are default with JP1 and JP2 fitted. For voltage inputs, remove JP1 and JP2.

One analogue output, 0 - 5 V with 1.2 mV resolution (12-bit accuracy).

### Alarms

POWR - Reset (on restoration of power)  
WDOG - Watchdog failure  
MEMF - Memory failure  
COMMS - Communication failure

## Actuator Mode

The below data is only visible if it is available with the connected actuator type.

### Digital control

Open, Stop, Close and ESD.

### Position control

Over range 0% to 100%.

### Digital feedback

The field unit reports the following status bits, (some of the options are not available on all actuator types):

OAS - Open limit switch  
CAS - Closed limit switch  
STOP - Motor stopped  
MRUN - Motor running  
MRO - Motor running in open direction  
MRC - Motor running in closed direction  
EXT - External digital signal, (only available when position control is **not** used).  
Other status bits relating to the GPFCU are also reported (e.g. loopback on, new alarm and alarm).

### Analogue feedback

Valve position from 0% - 100%.

### Alarms

POWR - Reset (on restoration of power)  
WDOG - Watchdog failure  
MEMF - Memory failure  
COMMS - Communication failure  
CNA - Local control selected  
MREL - Monitor relay tripped  
THERM - Thermostat tripped  
LSTOP - Local stop selected

### Derived alarms

SFAIL - Motor start or stop failure  
VOBS - Valve obstruction detected, torque tripped  
VJAM - Valve stuck detected, torque tripped  
MOP - Valve moved to open limit manually  
MCL - Valve moved to closed limit manually  
MOPG - Valve moved from closed limit manually  
MCLG - Valve moved from open limit manually  
EOT - Motor running at end of travel

# EXPLOSIONPROOF – FLP-PB2

## Enclosure

Cast aluminium (BS1490, LM25) with Rotork standard grey paint finish, BS4800-00A13, suitable for wall mounting using fixing plates or with clamps for 2" pipe mounting. Weatherproof to IEC 529, IP68.

## Approvals

Hazardous area approval to EC directive 94/9/EC EN50018 EExd. IIBT4.

## Alternative Approvals

Increase safety terminations EN50019 EExde

Factory Mutual approval:

Class 1 - Groups C and D division 1 locations per NEC Article 500.

CSA Hazardous approval:

Class 1 - Group C & D

Class 2 - Group E, F & G

## Terminals

TS35 DIN rail mounted cage clamp terminals suitable for up to 1.5 mm<sup>2</sup> conductors for power and signals. Double terminations are provided for power supply, earth & loop connections. An external 6 mm tapped hole is also provided for Earthing purposes.

## Conduit entries

A, B, C & D = 4 off max. M40, 1.5" ASA/NPT or PG29  
E to Y = 20 off max. M20, 0.75" ASA/NPT or PG13.5.  
See installation drawings for cable entry locations.

## Environmental specification

Operating temperature: -30°C to +70°C

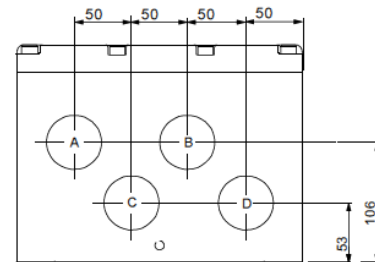
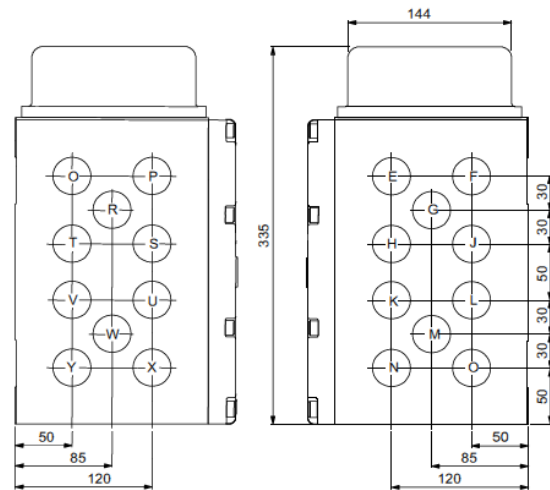
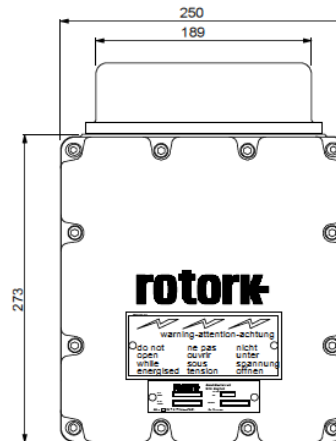
Storage temperature: -50°C to +85°C

Humidity: 5% - 95% R.H. non-condensing

Vibration: 0.75 g (0.5 Hz to 300 Hz)

## Ordering Details

With all orders, it is necessary to specify the supply voltage for the field unit, the enclosure approval required, the FLP-PB2 mounting arrangement and the conduit entry holes to be drilled, together with their size. Eight holes are included in the basic price and additional holes are extra.



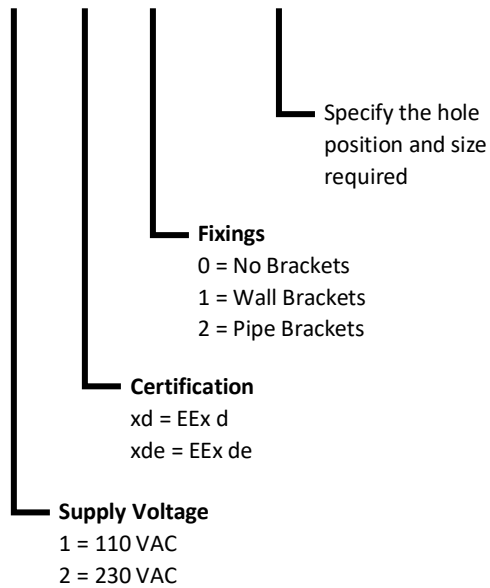
## MAXIMUM CONDUIT ENTRY SIZES

LOCATION	Metric	ASA/NPT	PG
A - D	M40	1.5"	29
E - Y	M20	0.75"	13.5

## Ordering Example

The order code for an explosionproof GPFCU Pakbox has the following format:

**FLP - PB2 - X - XXX - X - XXXX XXXX**



**FLP - PB2 - 2 - xd - 1 - A12, B12, C12, E12, F12, H12, J12, K12**

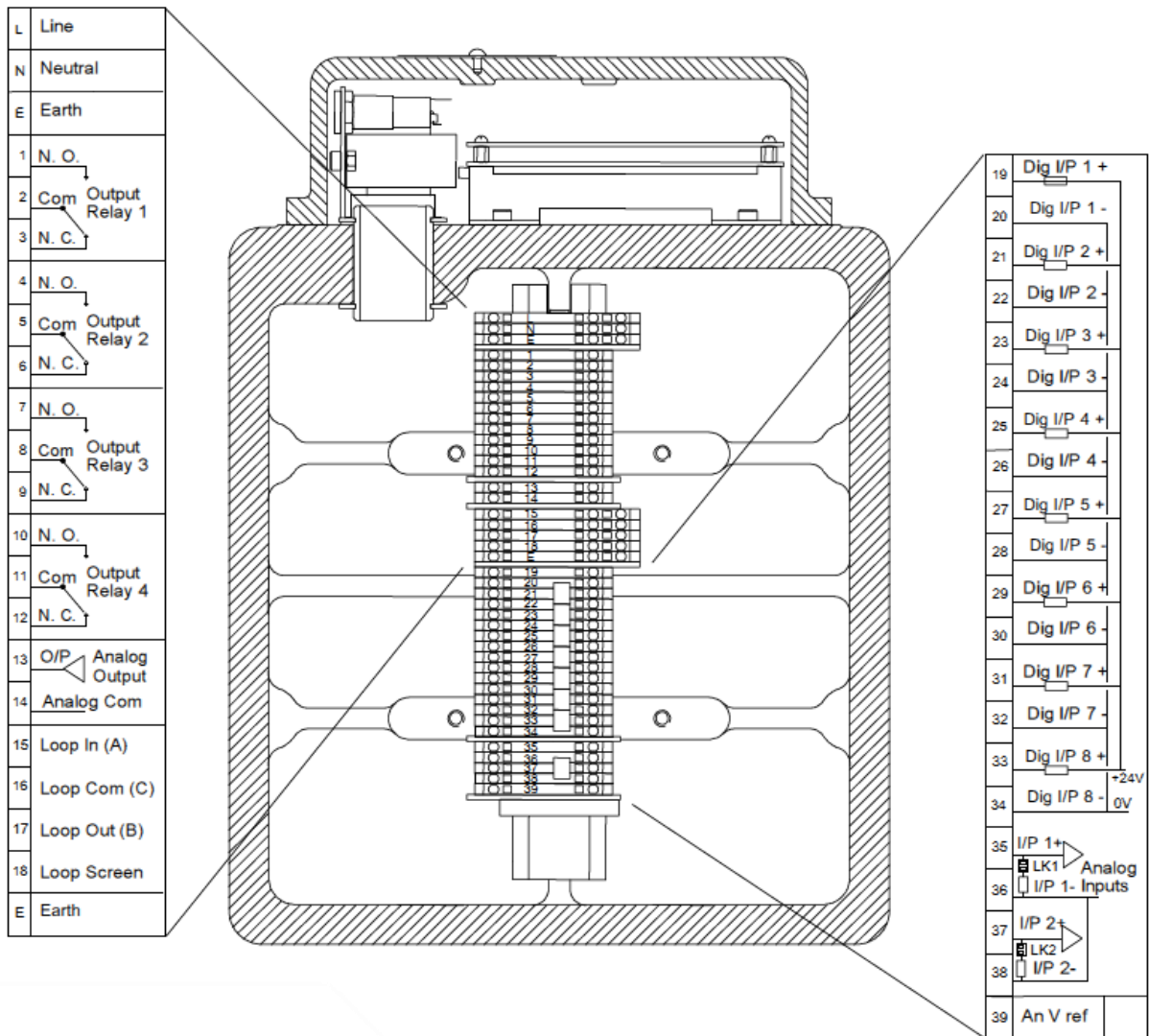
Explosionproof Pakbox  
110 VAC power supply  
EEx d certified enclosure  
Wall brackets included  
M12 conduit entries in position A, B, C, E, F, H, J and K

**FLP - PB2 - 1 - xde - 0 - B40, C40, E16, F16, H16, J16**

Explosionproof Pakbox  
230 VAC power supply  
EEx de certified enclosure  
No brackets  
M40 conduit entries in positions B and C  
M16 conduit entries in positions E, F, H and J



## Wiring Connection Details



# WEATHERPROOF – WP-PB2

## Enclosure

Glass fibre reinforced polyester with an opaque lid, finished in grey to RAL7032. The enclosure is suitable for wall mounting or alternatively with clamps for 2" pipe mounting. The external enclosure is weatherproof to IP65. The internal enclosure is polycarbonate.

## Terminals

Clamping terminals suitable for up to 4.0 mm<sup>2</sup> conductors for power supply, data highway, I/O and Earth connections.

## Conduit entries

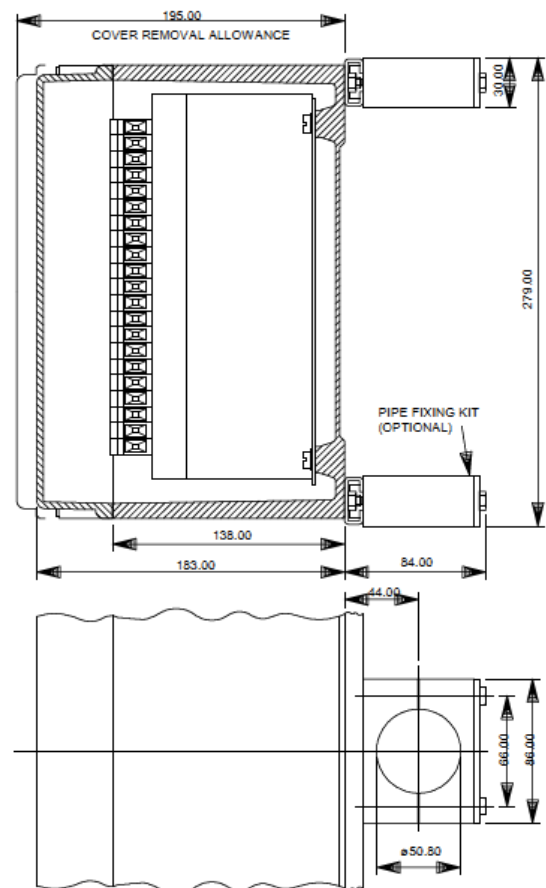
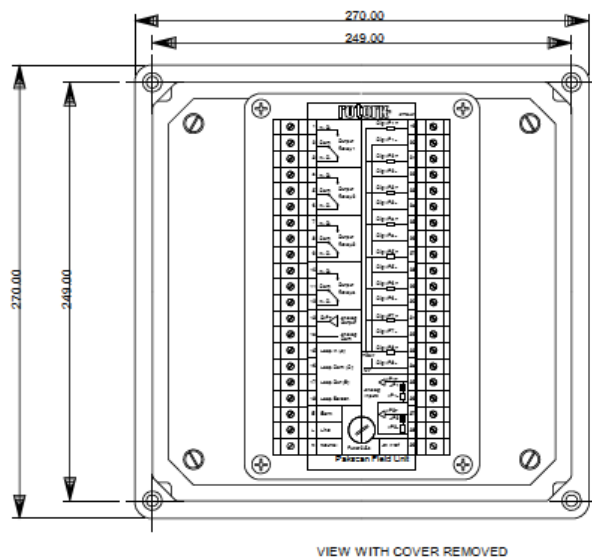
The enclosure is suitable for machining to accommodate required cable glands. No standard conduit entries are provided from the factory.

## Environmental specification

Operating temperature: -30°C to +70°C  
 Storage temperature: -50°C to +85°C  
 Humidity: 5% - 95% R.H. non-condensing  
 Vibration: 0.75 g (0.5 Hz to 300 Hz)

## Ordering Details

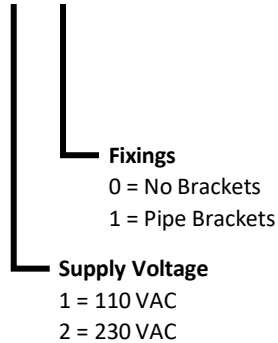
With all orders, it is necessary to specify the supply voltage for the field unit and the fixing option required.



### Ordering Example

The order code for a weatherproof GPFCU Pakbox has the following format:

**WP - PB2 - X - X**



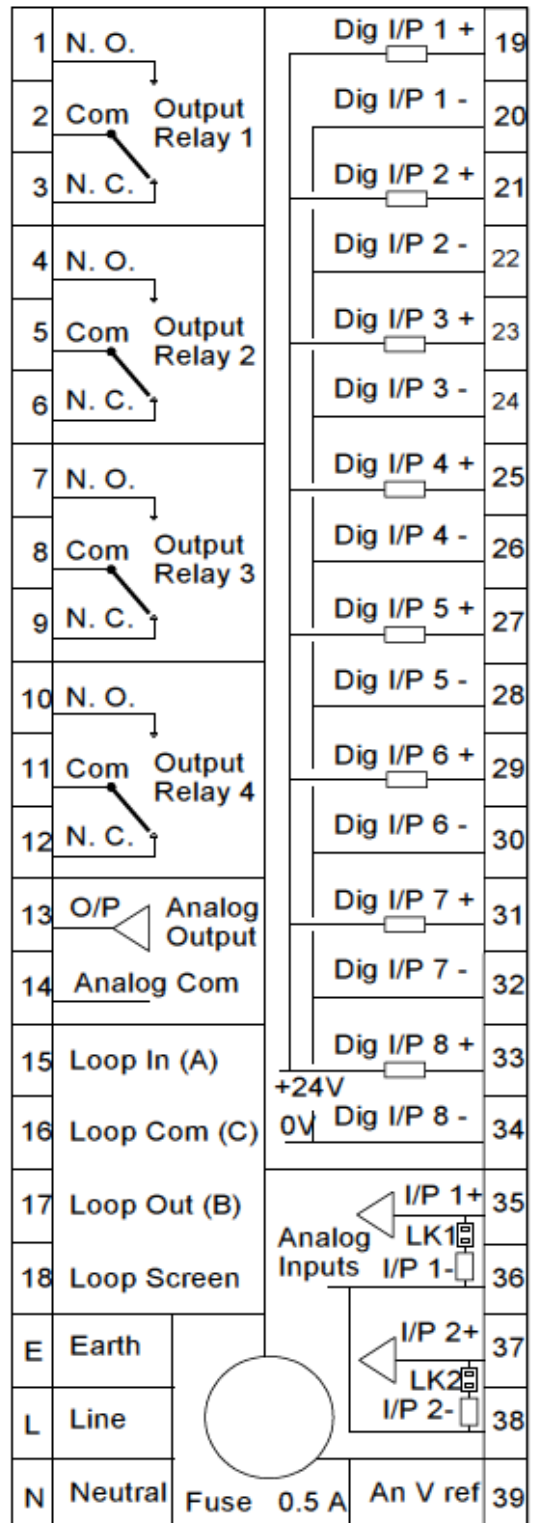
**WP - PB2 - 2 - 1**

Weatherproof Pakbox  
230 VAC power supply  
Pipe brackets included

**WP - PB2 - 1 - 0**

Weatherproof Pakbox  
110 VAC power supply  
No brackets included

### Wiring Connection Details



# PANEL MOUNTED – PM-PB2

## Enclosure

Glass fibre reinforced polyester with an opaque lid, finished to RAL7032 Grey. The enclosure is suitable for wall mounting or 2" pipe mounting. The external enclosure is weatherproof to IP65. The internal enclosure is polycarbonate.

## Terminals

Clamping terminals suitable for up to 4.0 mm<sup>2</sup> conductors for power supply, data highway, I/O and Earth connections.

## Conduit entries

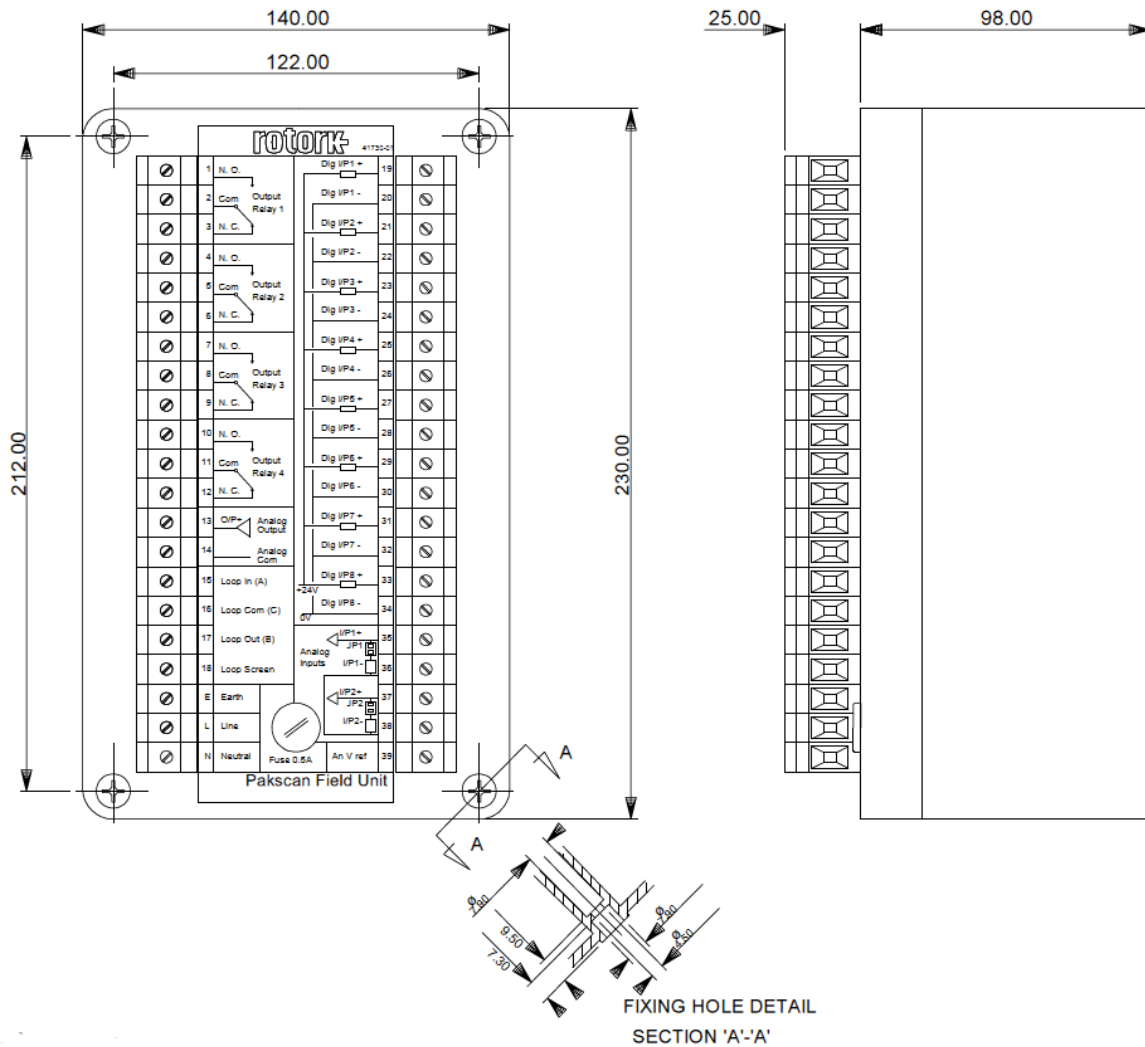
The enclosure is suitable for machining to accommodate required cable glands. No standard conduit entries are provided from the factory.

## Environmental specification

Operating temperature: -30°C to +70°C  
 Storage temperature: -50°C to +85°C  
 Relative Humidity: 5% - 95% non-condensing  
 Vibration: 0.75 g (0.5 Hz to 300 Hz)

## Ordering Details

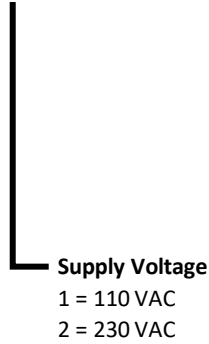
With all orders, it is necessary to specify the supply voltage for the field unit and the fixing option required.



### Ordering Example

The order code for a panel mounted GPFCU Pakbox has the following format:

**PM - PB2 - X**



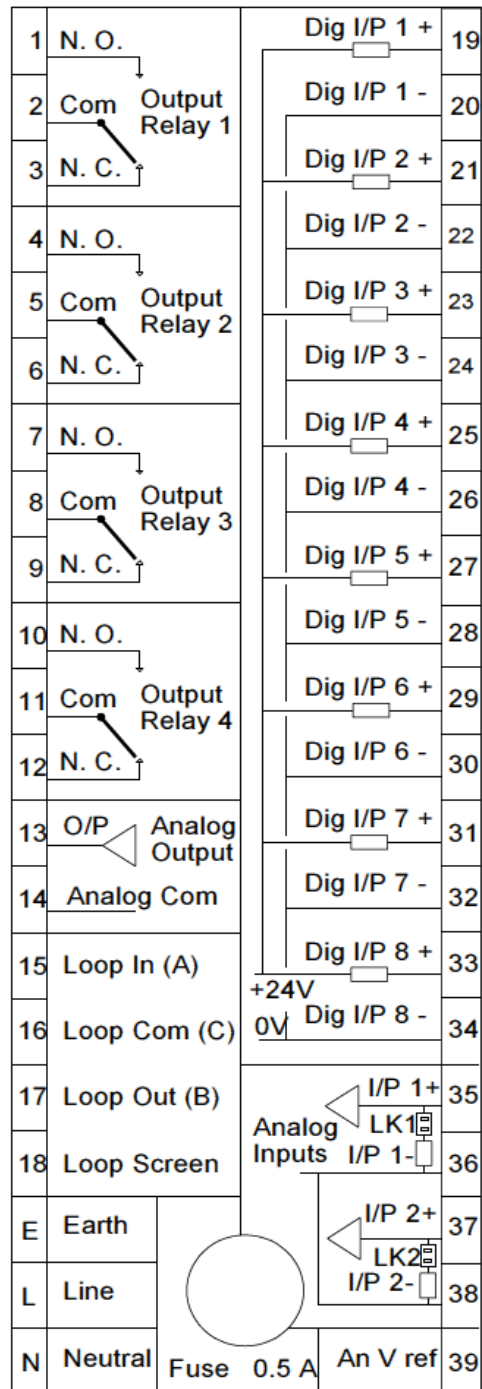
**PM - PB2 - 1**

Panel Mounted Pakbox  
 110 VAC power supply

**PM - PB2 - 2**

Panel Mounted Pakbox  
 230 VAC power supply

### Wiring Connection Details



# RACK MOUNTED – RACK-PB2

## Enclosure

Compact form factor with fixing points to suit a 19" rack. Protection from the environment must be fulfilled by the rack cabinet. Up to seven rack mounted GPFCUs can be fitted in one 19" rack chassis.

## Connections

The following connections are available:

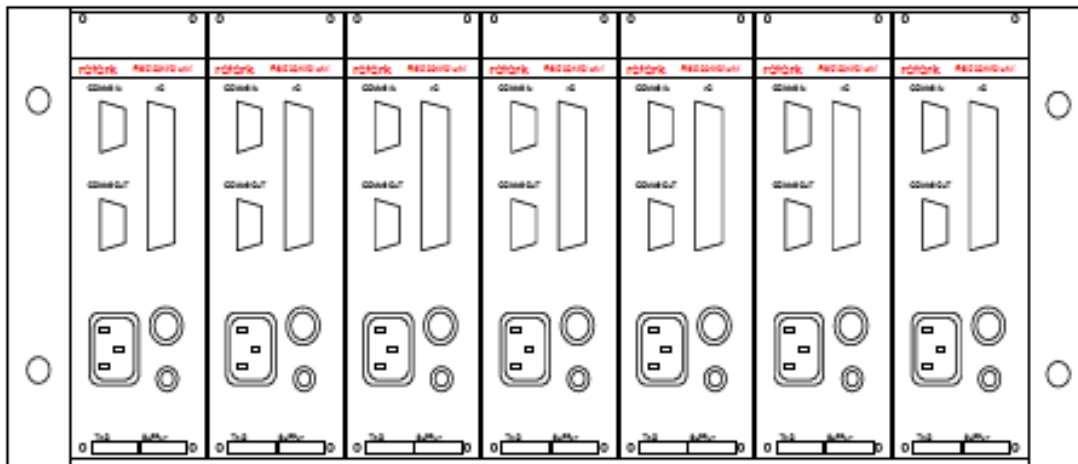
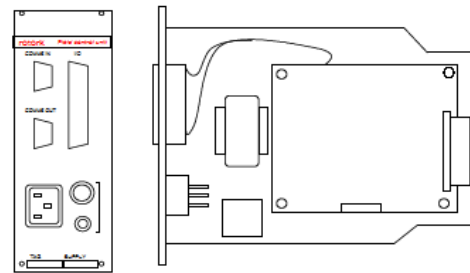
- IEC mains power connector with fuse and indicator
- 9-way D Type (female) socket for data highway input
- 9-way D Type (male) socket for data highway output
- 37-way D Type (female) socket for I/O.

## Environmental specification

Operating temperature: -30°C to +70°C  
Storage temperature: -50°C to +85°C  
Relative Humidity: 5% - 95% non-condensing  
Vibration: 0.75 g (0.5 Hz to 300 Hz)

## Ordering Details

With all orders, it is necessary to specify the supply voltage for the field unit. Supplied as a single GPFCU or installed in a 19" rack with additional GPFCUs or blanking plates. Contact Rotork to order.





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