



SCHLEIFENBAUER

LIVING FOR THE POWER TO DELIVER

Installation manual for for Schleifenbauer DPM3

Installatie handleiding voor Schleifenbauer DPM3

Installationsanleitung für Schleifenbauer DPM3

Guide d'installation du Schleifenbauer DPM3



Installation manual for Schleifenbauer Distribution Panel Meters (DPM3)


Product specifications


Voltage:	single-phase 230 V, three-phase 230/400 V $\pm 10\%$ single-phase 120 V, three-phase 120/208 V $\pm 10\%$
System:	three-phase: four-wire star; earthed neutral, three phase: three-wire delta (208V phase to phase only), single-phase: two-wire; earthed end of phase
Frequency:	50..60Hz $\pm 10\%$
Permitted load:	not applicable
Measurement voltage:	85-260VAC
Measurement range per channel:	max. 32 A when using 3CTee (max D = 6.8 mm), max. 63 A when using split-core (max D = 12 mm) max. 1200 A when using secondary 1200/5 CT
Power consumption:	max. 2 Watts,
Accuracy:	+/- 1% according to Class C EN 50470-3

Operating	
Temperature	0° to 55° Celsius
Height	-30 to 2000 m
Relative humidity:	10 to 90% non condensing
Pollution Class	2
Fire resistance Class	UL94-V2
Environment	Within IP20
Installation Category	III
Measurement Category	III
Protection class	II
Working conditions	Continuous

General

Safety instructions

 Always the safety instructions in this manual. should be taken into consideration. If the safety instructions, warnings and directions are not followed, this can result in serious or fatal personal injury and damage to the equipment!


 **The Distribution Panel Meter (DPM3) must be pre-fused via a residual-current circuit breaker as well as by means of a fuse for each phase of minimum 1A, maximum 6A type C, IEC/UL certified with a breaking capacity of at least 10 kA.**

The DPM3 may not be used:

- in a condensing environment;
- in a seriously contaminated environment;
- outdoors.

Installation, maintenance and inspection

Instructed professional

 The installation, maintenance and inspection of the DPM3 must be carried out by sufficiently trained people, in accordance with EN 50110-1, entirely in accordance with the stipulations in EN 50110-1 and NEN 3140.

Installation and activities

With all installation activities, such as the connection of current transformers, the power supply must be switched off. A switch or automatic fuse should be installed in the vicinity of the measurement module in order to disconnect power. This switch should also be marked as such.

Life-support environments

The DPM3 has been designed and made for use in power distribution systems. The DPM3 may not be used in an environment where, a malfunction in the DPM3 could have consequences for life-support systems. Such systems occur not only in medical environments such as hospitals, but also on off-shore platforms, in the petrochemical industry, in air-control systems, etc.

No internal maintenance is possible

DPM3s can not be opened by an unauthorised person. For the event of the malfunction of or a defect in the DPM3, the guarantee conditions should be consulted. The warranty will be void if the DPM3 has been opened or changes

have been made. The factory guarantee will be expired if the QC stickers are damaged or removed!

Installation requirements

Check before installation and use whether the properties of the electrical system to which, it is connected to conform the product specifications.

- The DPM3 has been designed to be connected to electrical systems that comply with EN 61010-1:2001, Low-voltage Guideline 2006/95/EC or, in the Netherlands, NEN 1010.
- Voltage and number of phases must correspond to given values. These data can be found on DPM3 or in the first page of this manual.
- Environmental factors must comply with the product specifications.

Contents of the packaging

The DPM3 is packed in a cardboard box. The packaging materials should be removed in a responsible manner in accordance with local legislation. After opening the box, it should be checked if all the components have been received.

Each DPM3 supplied package will contain:

- the DPM3 itself and
- the installation manual.

Please note that all the materials used are recyclable.

Inspection, testing and cleaning

Visual inspection

After opening the cardboard box and removing the packaging materials, the DPM3 must be visually inspected. In the event of defects through which safe and proper operation cannot be guaranteed, the DPM3 should not be put into use. In that case the manufacturer should be contacted.

Testing

The DPM3 may be inspected in accordance with the NEN 3140 standard. For measurement of the insulation resistance, use may exclusively be made of a measurement voltage that is lower than the voltage according to the product specifications.

Cleaning

The DPM3 can be externally cleaned, exclusively with a clean, dry cloth.

Connection

Connecting the mains power

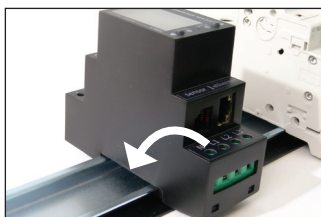
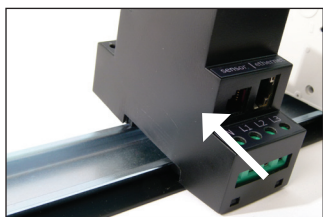
The DPM3 has been designed for use in a 3-phase star connected system with or without neutral. The three phases and neutral;

L1, L2, L3 and N, are connected to the DPM3 at the appropriate screw terminal at the bottom. Please pay attention that L1 serves for the power supply of the equipment as well as for measuring the voltage and thus, energy. Therefore, make sure that it is always connected and has the same and shortest possible connection with the voltages to be measured!

⚠ Use in a single-phase environment is nonetheless possible. In that case, the (measured) phase should be connected to L1, L2 and L3 in parallel. So, L2 and L3 are optional when only metering one single channel.

- The DPM3 should only be installed by certified professionals.
- All three phases should be connected to the inputs of the DPM3. L1 with L2 and L3 can only be interconnected when measurements are done on a single phase. While doing so, all three inputs must be connected.
- When using a secondary CT for higher currents, please pay attention that the secondary CT is short-circuited at all times when it is attached to a live wire.
- After installation, it should be checked that all CT's connections are in order.

Attachment of the DPM3 and current transformers



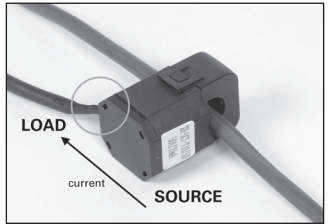
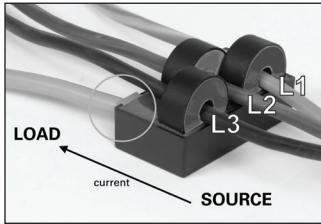
The DPM3 should be mounted in accordance with the current standards for DIN rail mounting. The mounting instructions should be read carefully and the DPM3 should be mounted with appropriate force. The CTs should be firmly secured by means of DIN rail clips, tie-wraps or other fasteners. The wiring can be trimmed to the desired length.

⚠ Please pay attention that the printed side of the CT is on the source side, the black side on the load side!

Connecting the connector to the wiring

The '3CTee' three-way current transformer and the split core single phase current transformer should be attached to the screw terminal according to the layout below.

3CTee		Split Core	
Yellow	CT1 (L1)	a	Brown or blue
Grey	CT1 (L1)	b	White
Green	CT2 (L2)	a	Brown or blue
Pink	CT2 (L2)	b	White
Brown	CT3 (L3)	a	Brown or blue
White	CT3 (L3)	b	White




Although the use of ferrules (0.34 mm²) is not mandatory with this type of connector, their use is recommended.

The above method of connection is the standard manner of connection. To avoid confusion, only this method is illustrated. For practical reasons, it could be necessary to mount the CT in a different direction. If the direction of current flow through the CT is reversed, then a and b connections on the screw terminals must be reversed. If the phases are conducted through the CT in a different order, this should be adjusted accordingly on the screw terminal.

Use of additional current sensor coils



A second CT can be used for measuring currents that exceed 32A (63A with the split core) or for conductors which have a diameter greater than 10 mm. This primary current transformer, which must be of the 5A secondary type (e.g. 1200/5, 200/5, etc.), must be mounted around the conductor and must always be short-circuited to prevent a voltage differential arising between the connection points. Generally, an extra connection is provided for a short-circuit wire, which must be used during installation.

 There is a risk of electric shock! Installation must be done by only certified professionals.

The wires between the CT and DPM3 must be kept as short as possible. It should be kept in mind that total accuracy will be less when an additional CT is used.

In most cases, a second CT will be used in a 3 phase system. In such cases, the three primary CTs can be connected to the DPM3 via a 3CTee. Please pay attention to the direction of the CTs . It should be checked if it is correct. The power factor in the DPM3 display also should be checked.

The CT MULTIPLIER factor (ratio) for the measurement currents can be adapted via the web interface. The correct ratio should be entered, as indicated on the primary CT, on the page under the INPUTS tab. Example: The CT has a ratio of 500/5 and the CT MULTIPLIER is therefore 100. '100' should be written in the entry field for the appropriate channels in the CT x section under the INPUTS tab.

Here again, please pay attention that both the primary and secondary CTs are mounted in the correct orientation and that each CT is connected to the correct phase. Immediately after making the connection, make sure the power factor displays an appropriate value.

Switching on for the first time

Before switching on the DPM3 for the first time, it must be allowed to acclimatise to its operating temperature for at least 24 hours. Large temperature differences can cause condensation in the DPM3 if this rule is not followed.

Checking operation

On the display, various information pages can be viewed by using the left and right buttons. The test voltage and power can be seen in these pages. The correct installation of the CTs can only be verified by checking the power factor only if the current flows. If this is zero, then the CT has been installed in a wrong way regarding the direction of flow. In that case, the direction of the wire should be reversed or the pairs of wires (a-b) on the screw terminals should be exchanged. It should be kept in the mind that an incorrect power factor can also indicate reversal of the phases.

The DPM3 and the following table should be used to verify when the monitored lines are under load. When no load is connected it is not possible to determine the right connection of the CTs.

Power Factor in %	Problem	Solution
0	CT is reversed	Direction of the CT should be changed or the connection on the DPM3 should be swapped.
$0 < Pf < 30$	CT connected to wrong phase	Right phase for this CT should be found or the connection on DPM3 should be changed to another phase.

Connecting the data bus

The serial data bus in the DPM3 is based on 4 wire twisted pair cables. Each DPM3 has 2 miniature 4 pin Har-Flexicon connectors that make looping possible. The Har-Flexicon plug should be connected to one of the connectors marked data bus. There is no difference between the 2 data bus connections. The other end of the patch cable should be connected to the nearest DPM3 that is already connected to the data bus, to a Gateway or RS485/TCPIP converter using a Har-Flexicon to RJ45 cable. The user manual should be checked for further information on configuration.

The Har-Flexicon IDC connectors can be crimped without any special tooling to 0.05 – 0.14mm² (AWG 28 – 26) wiring without stripping.

Connector pinout:		
from left to right:		
Pin	Signal	color (T568B)
4	NC	-
3	gnd	white/green stripe
2	B	orange solid
1	A	white/orange stripe



Connecting the DPM3 to a LAN

If the DPM3 is connected exclusively, or simultaneously with the data bus, to a Local Area Network (LAN), the RJ45 connector for the network cable must be plugged into the Ethernet port.

The default setting for the DPM3 is 'DHCP' and the DPM3 waits until it has been assigned an IP address by the DHCP server. If the DPM3 does not receive an IP address within a set time, it will proceed using the default value of 192.168.1.220 (255.255.255.0)

When using 'DHCP fallback to static IP', we recommend that you enter a unique IP address for each hPDU. This approach prevents all of the DPM3s from being assigned the same IP address in the event of a faulty DHCP server. The web interface can be accessed using any web browser using the user-name 'admin' and default password 'admin'.

Sensor port

The sensor port provides connectivity to the digital combined humidity/temperature sensor, the temperature sensor or the sensor module. The same port provides two dry switch contacts on in pin 1 and 6 and pin 1 and 3. Using both the D/S port and digital sensors requires a custom adapter cable but it is supported.

Wiring Details

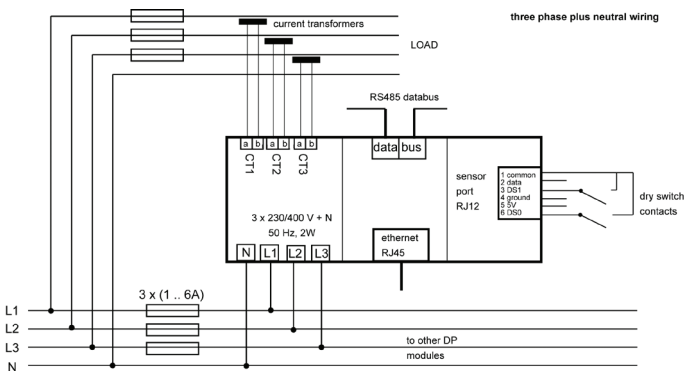
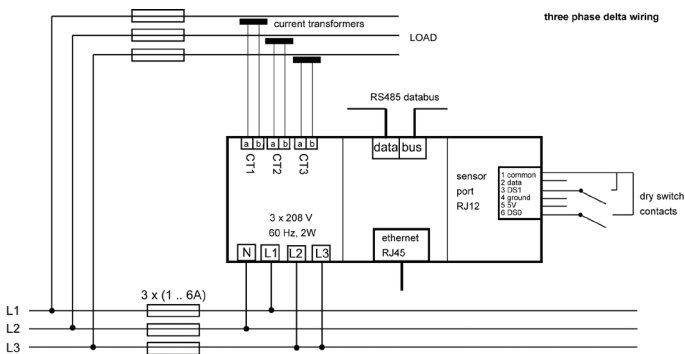
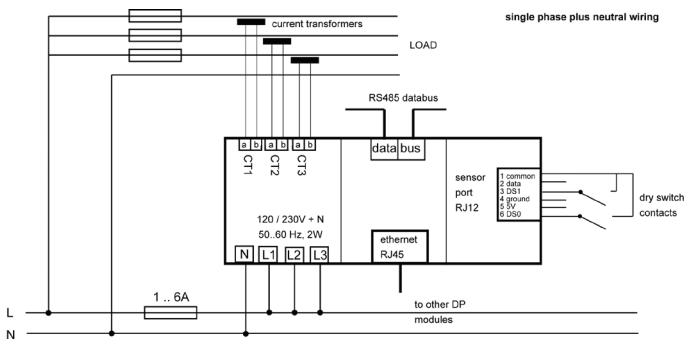
For CT contacts, below mentioned cable ranges must be used:

- Stranded wire: 0.05 .. 1.0 mm²
- Solid wire: 0.05 .. 1.5mm²
- Stripping length: 5 .. 6mm
- Torque: 0.5 .. 0.6 Nm

For Power contacts, below mentioned cable ranges must be used:

- Stranded wire: 0.05 .. 2.5 mm²
- Solid wire: 0.05 .. 1.5mm²
- Stripping length: 5.5 .. 6.5mm
- Torque: 0.5 .. 0.6 Nm

Wiring Diagrams



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