

Digital instruments

DH series

Digital instruments for panel mounting

**Description**

- Digital equipment designed to display the programmed value of an electric variable or process signal, depending on the type. It is also useful for the regulation of relay output cards (alarms)
- Fully programmable: scale, transformer ratio, alarm relays, communications, etc.
- Measurement of V, A, Hz and processes (impulses, weight, temperature, pressure, etc.)
- Measurement in true root mean square (TRMS), ac types.
- Multiple options with expansible cards
- High-precision
- Installation on the panel 96 x 48 mm

Application

- The high luminosity 4-digit digital display indicates the voltage, current, frequency, etc. and it can be used to define the alarms of the different electrical parameters measured.

Features

Power supply circuit	230 Vac (-15 ... +20%)
Frequency	4 V·A (without card), 7 V·A (with card)
Consumption	45...65 Hz
Measurement circuit	
Overvoltage (permanent / during 10 s)	$1.2 U_n / 2 U_n$
Overload (permanent / during 10 s)	$1.2 I_n / 5 I_n$
Measurement margin	2 .. 120 %
No. of conversions per cycle	32
Display	Seven 14 mm segments, red
Decimal place	Programmable
Scale excess indicator	"- - -"
Insulation	
Test voltage	3 kV, 50 Hz, 1 min
Impulse test	4 kV (1.2 / 50 s)
Ambient conditions	
Storage temperature	-40 ... +70 °C
Operating temperature	-10 ... +65 °C
Build features	
Box material	ABS V0, grey anthracite
Degree of protection	Box and terminals: IP 20 / Front panel: IP 54
Weight	550 g
Standards	
In A, C, P types:	IEC 1010, IEC 348, IEC 664, VDE 0110, VDE 0435
In other types:	IEC 1010, IEC 348, IEC 664, EN 50081-1, EN 50082-1

References**DH96. Ammeter or Voltmeter**

Measurement	Parameters	Range	Scale	Accuracy	Display	Type	Code
DC	A or V	200 Vdc or 200 mA	200 mA or 50,100, 200 V	0.2 % (± 1 dig)	4 digits	DH 96 C	M20411
AC	A or V	600 V ac or ... / 5 A	... / 5 A or 150, 300, 600 V	0.5 % (± 1 dig)	4 digits	DH 96 A	M20412

Digital instruments

DH series

Digital instruments for panel mounting



References

DH96. Ammeter

Measurement	Parameters	Range / Scale	Accuracy	Display	Type	Code
AC	A	...10 A	0.5 % (± 1 dig)	4 digits	DH 96 A (10 A)	M20413
AC	A	... / 5 A (start-up of motors 5 * In during 10)	0.5 % (± 1 dig)	4 digits	DH 96 A (... / 5 A)	M20414

DH96. Ammeter and voltmeter (with shunt .../60 mV)

Measurement	Parameters	Range / Scale	Accuracy	Display	Type	Code
DC	A and V	Programmable: V and A Range of V: 1 to 100 V Range of A: With shunt .../60 mV	0.2 % (± 1 dig)	4 digits	DH 96 A V	M2041C

* Expansion cards are not used

DH96. Earth leakage current indicator

Measurement	Parameters	Range	Scale	Accuracy	Display	Type	Code
AC	mA	10 mA to 3.3 A	Programmable: 300 mA or 3 A	0,5 % (± 1 dig.)	4 digits	DH 96 WG	M2041A

DH96. Measurement station

Measurement	Parameters	Range	Scale	Accuracy	Display	Type	Code
DC	V, A, kW, kW-h	Range of V: up to 800 VVdc Range of A: .../60 mV	Programmable: Selec. V: 100 / 300 / 800 Vdc	0,2 % (± 1 dig.)	4 digits	DH 96 CPM	M20419

DH96. Universal process indicator

Measurement	Parameters	Range Scale	Accuracy	Display	Type	Code
DC	-	± 20 mA, ± 1 mA, ± 120 mV, ± 500 mV, ± 10 V	0,2 % (± 1 dig.)	4 digits	DH 96 P	M20415

DH96. Frequency meter and tachometer

Measurement	Parameters	Range / Scale	Accuracy	Display	Type	Code
-	Hz, r / min	0.1 ... 20000 Hz	-	5 digits	DH 96 FT	M20417

DH96. Chronometer and impulse meter

Measurement	Parameters	Range / Scale	Accuracy	Display	Type	Code
-	S, min, h, No. impulses	Programmable to measure time and impulses	-	5 digits	DH 96 CT	M20418

DH96. Temperature

Measurement	Parameters	Range / Scale	Accuracy	Display	Type	Code
-	°C	RTD sensor and thermocouple	0.2 % (± 1 dig)	5 digits	DH 96 TMP	M2041E

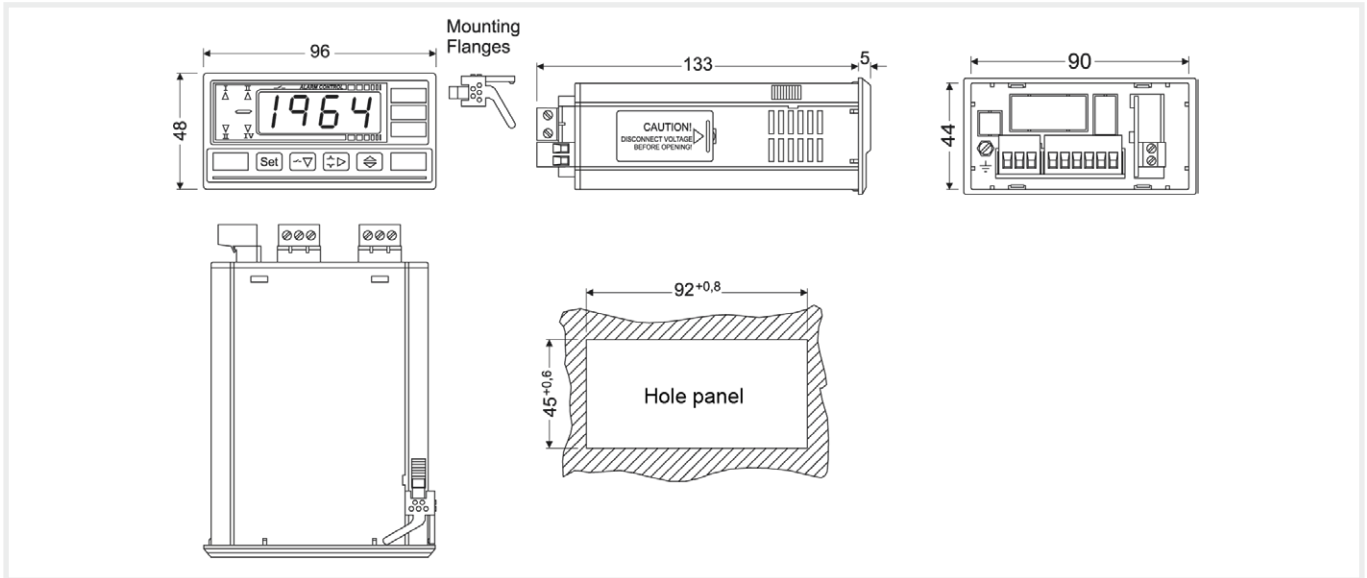
Digital instruments

DH series

Digital instruments for panel mounting

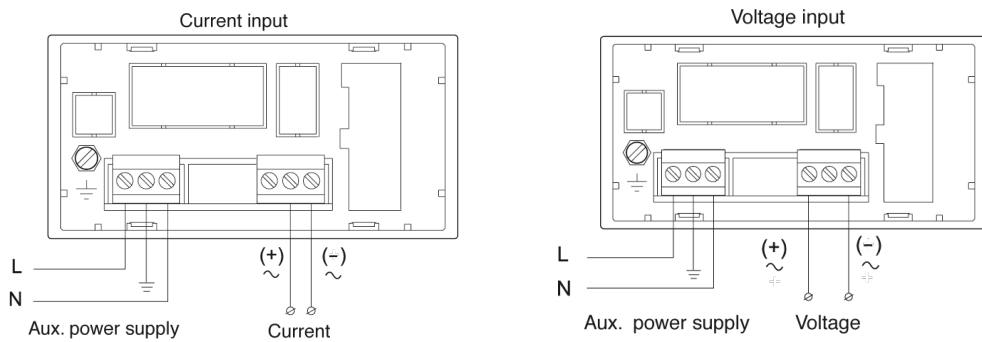


Dimensions

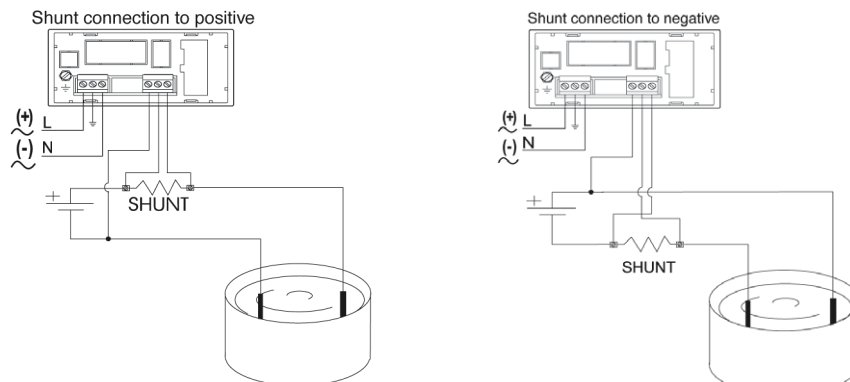


Connections

DH96 - A/C/P



DH96 - AV/CPM



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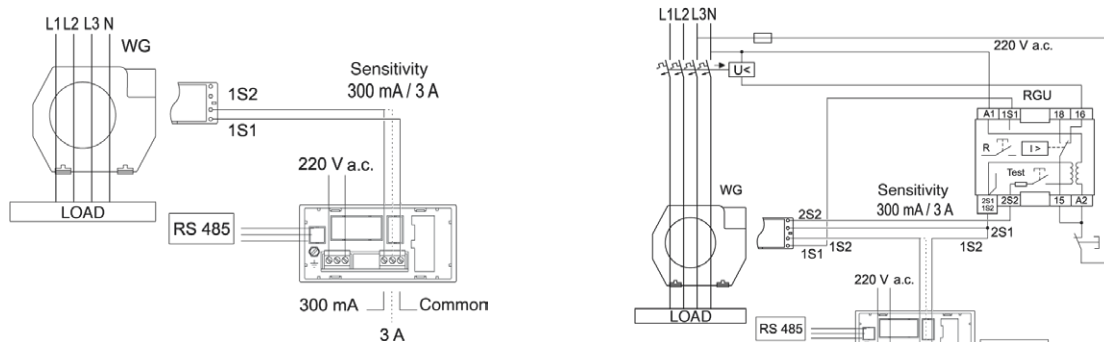
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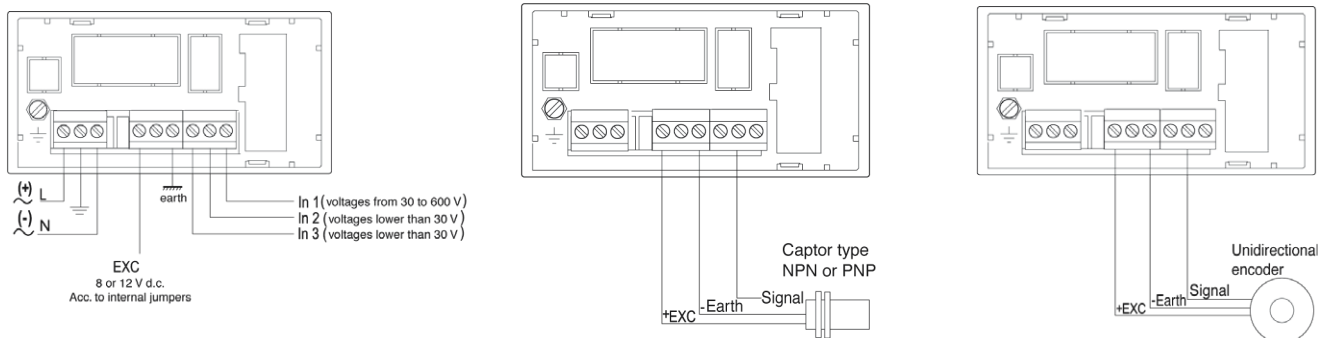


Connections

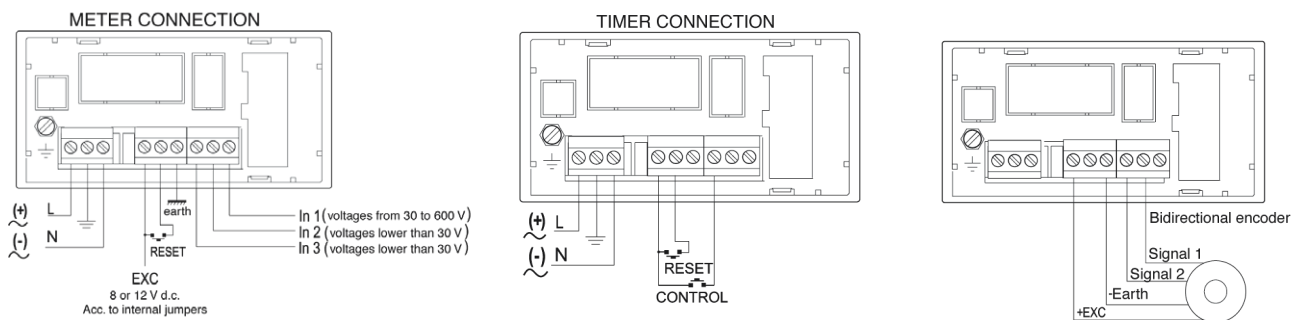
DH96 - WG



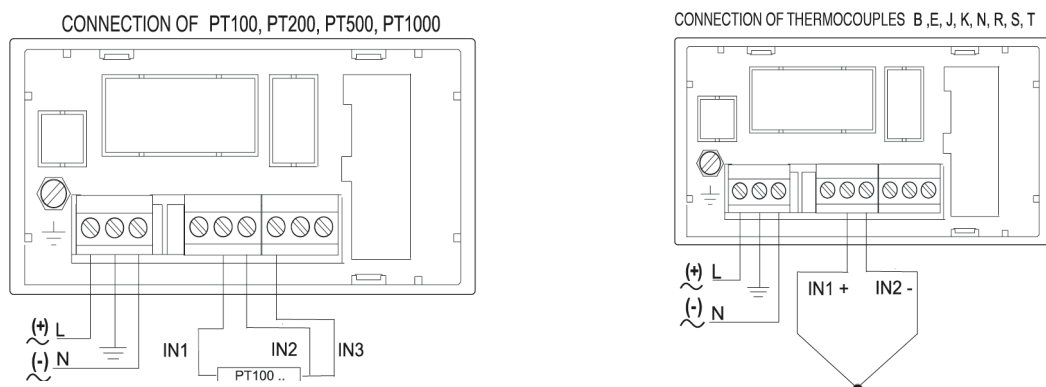
DH96 - FT



DH96 - CT



DH96 - TMP



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DH series

Digital instruments for panel mounting

Types	COMPATIBILITY WITH DH 96 MODULES									Code
	C	A	AV	WG	CPM	P	FT	CT	TPM	
2 relays	•	•	-	•	•	•	•	•	•	M20421
4 relays	•	•	-	•	•	•	•	•	•	M20422
2 relays + RS-485 or RS-232 (Modbus/RTU)	•	•	-	•	•	•	•	•	•	M20423
4 relays + RS-485 or RS-232 (Modbus/RTU)	•	•	-	•	•	•	•	•	•	M20424
Analogue output 0 / 4...20 mA	•	•	-	•	•	•	•	•	•	M20425
Analogue output 0 / 2..10 V	•	•	-	•	•	•	•	•	•	M20426
RS-232 (Modbus/RTU)	•	•	-	•	•	•	•	•	•	M20427
RS-485 (Modbus/RTU)	•	•	-	•	•	•	•	•	•	M20428
Analogue output 0 / 4...20 mA + 2 relays	•	•	-	•	•	•	•	•	-	M20429
Auxiliary power supply (0...10 V) Compatible with all units, except relays + communications	•	•	-	•	•	•	•	•	•	M2042A

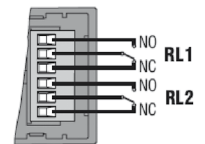
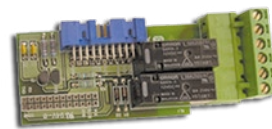
Module 2 relays

Description

- Connection of alarm when maximum or minimum values are reached
- Alarm connection and disconnection delay, programmable between 1 and 9999 seconds
- Hysteresis can be selected between 1 and 9999 points
- Optional alarm interlocking
- Optional fail-safe relay

Features

Relay	Switched
Nominal AC Current	8 A
Maximum voltage	250 Vac
Maximum resistive load	2000 V·A
Insulation resistance (at 500 V dc)	>1000 M
Contact - coil insulation	4 kV
Contact - contact insulation	1 kV
Mechanical working life (No. of operations)	>10 ⁷
Electrical working life (8 A; 250 V ac) (No. of operations)	>10 ⁵
Standards	VDE 0435, VDE 0700, VDE 0110, VDE 0106

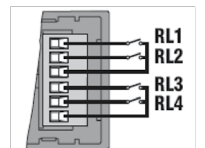
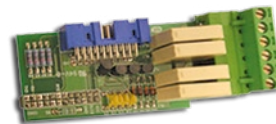


Module 4 relays

Description

Features

Relay	Simple
Nominal AC Current	5 A
Maximum voltage	250 Vac
Maximum resistive load	750 V·A
Insulation resistance (at 500 V dc)	>1000 MΩ
Contact - coil insulation	2 kV
Contact - contact insulation	750 Vac
Mechanical working life (No. of operations)	>20 x 10 ⁶
Electrical working life (8 A; 250 V ac) (No. of operations)	>30 x 10 ³
Standards	UL 508, C22.2 no. 14, VDE 0435



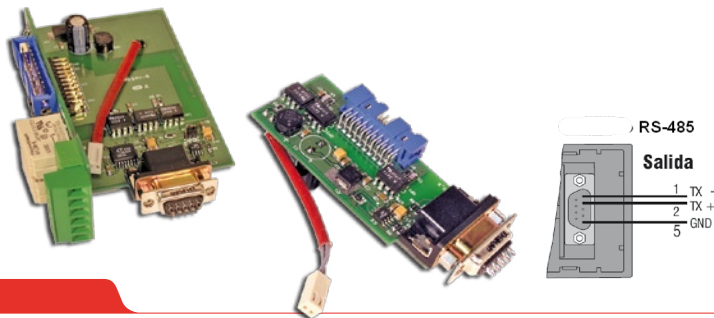
DIN

DH series

Digital instruments for panel mounting

Communications module**Description**

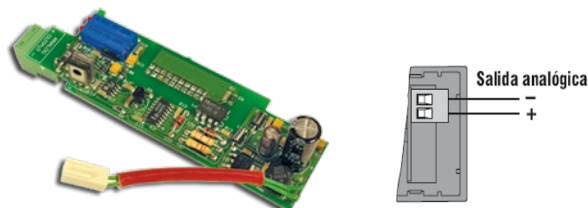
- Number of peripherals, programmable between 0 and 247
- Selection of the instrument's direction (only in RS-485)
- Selection of the communication parameters: speed, parity and stop bits

**Features**

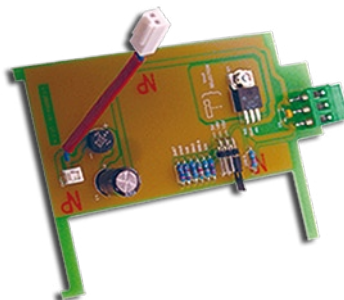
	RS-232 Module	RS-485 Module
EDS Protection	Up to 10 kV ac	Up to 2 kV ac
Communication lines protected against overloads, short-circuit to earth	30 V without damage	-
Protected against blockages	Yes	-
Communication lines with thermal protection against excessive power dissipation	-	Yes
Connection or disconnection from the active network	-	Yes
Standards	EIA RS-232	EIA RS-485

Analogue output module**Description****Features**

Resolution	14 bits
Maximum load impedance for current outputs	500
Maximum load impedance for voltage outputs	500
Insulation between analogue outputs and the power supply	3 kV
Insulation between analogue and measurement outputs	3 kV
Response time	< 100 ms
Rippling, in TRMS	< 0,5 %
Temperature coefficient	100 ppm / °C
Standards	IEC 1010, IEC 529, IEC 801, EN 50081-2, EN 5002-2

**Auxiliary power supply module (DH96P)****Description**

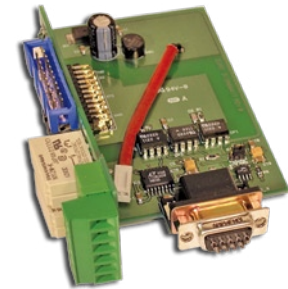
- Auxiliary voltage can be selected between 5, 10, 15 V dc
- Compatible with all modules (except with relay + communications modules)
- 2 and 3 wire power supply for the sensor 0 / 4...20 mA



DIN

DH series

Digital instruments for panel mounting



Communications module + 2 / 4 relays

Description

COMMUNICATIONS Features

- Number of peripherals, programmable between 0 and 247
- Selection of the instruments direction (only in RS-485)
- Selection of the switching speed 1200, 2400, 4800, 9600 and 19200 bits/s
- Selection of the parity: odd, even or no parity
- Selection of *stop* bits: 1 or 2

COMMUNICATIONS Features

	RS-232 Module	RS-485 Module
EDS Protection	Up to 10 kV	Up to 2 kV
Communication lines protected against overloads, short-circuit to earth	30 V without damage	-
Communication lines with thermal protection against excessive power dissipation	-	Yes
Connection or disconnection from the active network	-	Yes
Fully protected against blockages	Yes	-
Standards	EIA RS-232	EIA RS-485

RELAYS Features

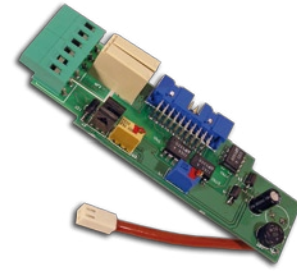
RELAY Features

	2 Relays	4 Relays
Nominal current	8 A	5A
Maximum voltage	250 Vac	
Maximum resistive load	2000 V·A	750 V·A
Insulation resistance (at 500 Vdc)	> 1000Ω	Yes
Contact - coil insulation	4 kV	2 kV
Contact - contact insulation: 2/4 relays	1 kV	750 Vac
Mechanical working life (No. of operations)	10 ⁷	20 x 10 ⁶
Electrical working life (8 A and 250 V) (No. of operations)	> 10 ⁵	>30 x 10 ⁴
Standards	VDE 0435, VDE 0700, VDE 0110, VDE 0106	UL 508, C22.2 no. 14, VDE 0435

DIN

DH series

Digital instruments for panel mounting



Communications module + 2 relays

Description

ANALOGUE OUTPUT Features

- Optional output programming: 0...20 mA or 4...20 mA
- Optional reprogramming of the output margin

ANALOGUE OUTPUT Features

Resolution	14 bits
Maximum load impedance for current outputs	500 Ω
Minimum load impedance for voltage outputs	500 Ω
Insulation between analogue outputs and the power supply	3 kV
Insulation between analogue and measurement outputs	3 kV
Response time	< 100 ms
Rippling, in TRMS	< 0,5 %
Temperature coefficient	100 ppm / °C
Standards	IEC 1010, IEC 529, IEC 801, EN 50081-2, EN 50082-2

RELAYS**Features**

- Connection of alarm when maximum or minimum values are reached
- Alarm connection and disconnection delay, programmable between 1 and 9,999 seconds
- Hysteresis can be selected between 9,999 and 9999 points
- Optional alarm interlocking
- Optional fail-safe relay

2 RELAY OUTPUT Features

Maximum voltage	250 Vac
Maximum resistive load	750 V·A
Insulation resistance (at 500 Vdc)	> 1 000 M
Contact - coil insulation	2 kV
Contact - contact insulation	750 Vac
Mechanical working life	20 x 10 ⁶ operations
Electrical working life (8 A and 250 V)	> 30 x 10 ³ operations
Temperature coefficient	> 30 x 10 ³ operations
Standards	UL 508, C22.2, VDE 0435

Coding table

M	2	X	X	X	X	0	0	X	X
Code						Internal Code			
Auxiliary power supply						Standard (230 V)	0		
						100 ... 120 V ac	1		
						380 ... 400 V ac	3		
						480 ... 500 V ac	4		
						18 ... 36 V dc	7		
						36 ... 72 V dc	8		
						40 ... 170 V dc	9		
Current input						Standard (... / 5 A)	0		
						... / 1 A	1		