

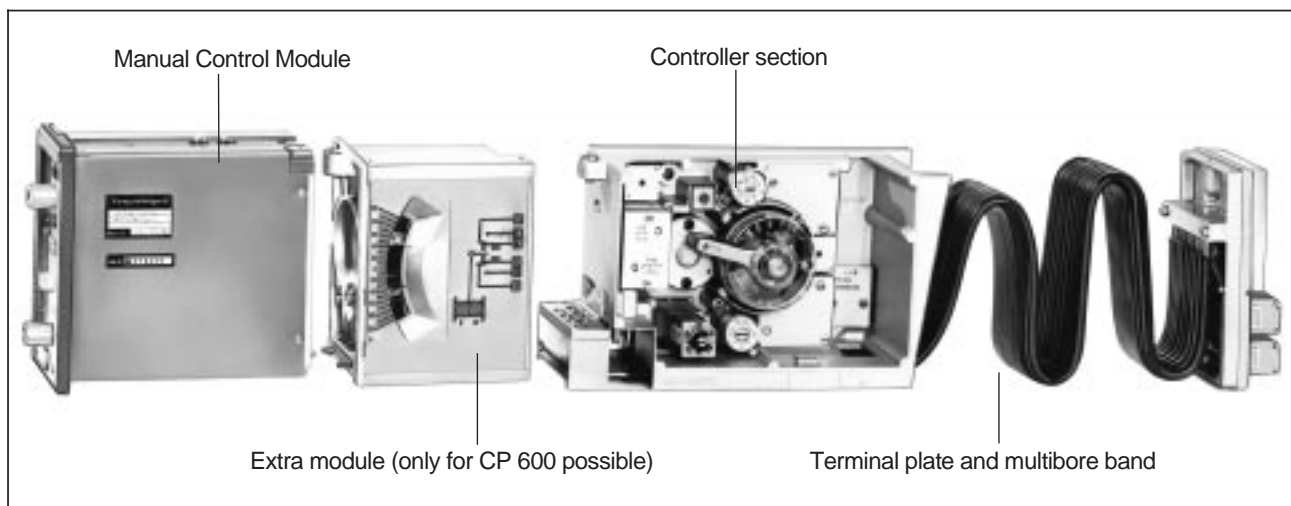
PC451 Pneumatic Controller Compact P
PM451 Pneumatic Manual Control Unit Compact P
PM455 Pneumatic Ratio Station Compact P



CP 600/400 Controllers and Manual Control Stations for the automatic control of process plants. CP 200 Manual Control Units with terminal plate and separately mounted Controllers simplify installation in consoles, due to the reduced insertion depth of 193 mm.

FEATURES

- Flat scale indication
- Bellows measuring systems
- All important information and controls located at the front. No controls have a double function
- Modular construction
- Mounting in individual housing or shelf
- Pre-installation and connection can be carried out
- Pneumatic circuitry carried within diecast backplates
- Controller is plug-in-type, with self-seating connections to Manual Control Unit
- Test switch
- Optional additional features Among other things:
 - Bumpless transfer M → A and A → M
 - Limitation of controller output
 - Inductive or microswitch alarms
 - Alarm lamps (LED)
 - Built-in I-p Converter
 - Pi switch
 - Ratio controller
 - Manual Control Stations
 - Manual Control Units 193 mm long, Controller separated



TECHNICAL DATA

Complete instrument

Frontal dimensions ¹⁾	72 x 144 mm
Lenght	605 mm or 465 mm, 193 mm for Manual Control Unit
Front finish	Bezel grey RAL 7037 Facia grey RAL 7035
Measured value x2–1 bar, 3–15 psi, 20–100 kPa
Set point w2–1 bar, 3–15 psi, 20–100 kPa
Output y2–1 bar, 3–15 psi, 20–100 kPa
Supply air	1.4 ± 0.1 bar / 20 ± 1.4 psi
Inherent air consumption ²⁾	≤ 500 l/h
Load effect ²⁾ (measured at 0.6 bar)	Deviation –3 % for 1200 l/h delivered flow Deviation +3 % for 550 l/h exhausted flow
Max. air output ²⁾	+1250 l/h; –950 l/h

Ambient conditions

Application class	HSF acc. to DIN 40 040
Ambient temperature range	–20 to +70 °C
Storage temperature range.	–30 to +70 °C
Adm. rel. humidity	≤ 75 %, no condensation
Protection class	IP 20 acc. to DIN 40 050

Installation

CP 600/400	individual housing or shelf
CP 200	without housing
Type of mounting	Panel
Panel mounting bracket	acc. to DIN 43 834
Mounting Position	NL 90 ± 5°; other position specify with order
Pneumatic connections.	internal thread DIN 45 141–Q ¹ / ₈ -27 NPT
Electrical connections	screw terminals for 0.5 to 2.5 mm ² leads/flat pins 6.3 x 0.8

Inscription

Nameplate	62 x 7 mm, replaceable
Inscription	as specified
Height of characters	max. 4 mm in 1 line/ 2 mm in 2 lines
Number of charac. per line	max. 22 with spacing 2.6 mm

Materials

Bellows.	Copper-beryllium
Other internal Components.	aluminum, brass, zinc-plated steel
Individual housings	Steel, plastic coated
Shelf.	enamelled steel

Weight

Complete Controller	CP 600 approx. 6.0 kg CP 400 approx. 5.5 kg
Manual Control Station	CP 600 approx. 3.5 kg CP 400 approx. 3.0 kg
Manual Control Unit	CP 200 approx. 3.5 kg
Ratio Station.	CP600/400 approx. 5.5 kg

1) Nominal dimensions acc. to DIN 43 700

2) measured with X_p = 100 % or PI-controller
(without additional equipment)

TECHNICAL DATA (continued)**Manual Control Station/Module**

Double indicator for x and w with flat scale	
Scale	replaceable
Scale length	100 mm
Indication range	0 to 100, other available
Graduation	linear/root other scaling available
Error limit	class 0.6 resp. ¹⁾
Double indicator for output	
Scale length	32 mm
Indication range	0 to 1.2 bar, 0 to 18 psi, 0 to 120 kPa
Error limit	class 1.6 ²⁾
Signal generators for set point and manual output	
Output adjustable	0 to 1.2 bar, 0 to 18 psi, 0 to 120 kPa
Supply air dependency	≤ 0.25 %/0.1 bar
Air consumption	≤ 100 l/h per signal generator
Load effect (m. at 0.6 bar)	+3 % for 70 l/h exhausted flow -3 % for 150 l/h delivered flow
with tracking unit	+3 % for 50 l/h exhausted flow -3 % for 80 l/h delivered flow
Max. air output	+ 1400 l/h; -1200 l/h
with tracking unit	±1000 l/h
Manual-auto switch	push-buttons
Remote-local switch for set point	bumpless transfer, operated from the front
Housing lock	to DIN 43 832 for securing instrument in housing

Ratio Station with mechanically set factor

Flat scale double indicator	
Scale	replaceable
Scale length	100 mm
Indication range of measured variable w'	0 to 100, other on request
Graduation	linear/root, other on request
Indication range of multiplication factor	0.5 to 2/0.7 to 1.4
Error limit	class 0,6 ¹⁾
Multiplication factor	0.5 to 2/0,7 to 1.4
set from front of panel or internally	
Air consumption	≤ 350 l/hr
Supply air influence*	≤ 0.2 %/0.1 bar
Temperature influence*	≤ 0.2 %/10 K
Load influence	+3 % for 300 l/h exhausted flow -3 % for 300 l/h delivered flow
Max. air capacity	1250 l/h

- 1) Class 0.6 for indicating range 0 to 90 %, class 1 for indicating range 90 to 100 % to DIN 16 310, or accuracy to SAMA-Standard PMC 20.1-1973
- 2) DIN 16 005, or accuracy to SAMA-Standard PMC 20.1-1973
- 3) measured with $X_p=100\%$ or PI-controller
- 4) only for Compact P600
- 5) to VDE/VDI 3520

* measured at factor 1

Controller section

Control system	cross-bellows
Control actions	P, PD, PI, PID
Operating point of P or PD Controller	pneumatically adjustable internally or remotely
Proportional band X_p	5 to 400 % and higher
Gain K_p	20 to 0.25 and lower
Reset time T_n	0.03 to 50 mins.
Derivative time T_v	0.03 to 20 mins.
Tracking error ³⁾	≤ 0.7 %
Alignment offset ³⁾	≤ 0.7 %
Inherent air consumption ³⁾	≤ 300 l/h
Supply air dependency ³⁾	≤ 0.2 %/0.1 bar
Temperature effect ³⁾	≤ 0.2 %/10 K
Sensitivity ³⁾	≤ 0.1 %
Optional additional equipments:	
Auto-selector, P-PI conversion, ext. reset High or low limitation of (R or Y_A and R)	cut-off point adjustable 0.2 to 0.6 bar/0.6 to 1.0 bar
Tracking relay	for bumpless transfer manual → auto
PI switch	reset bellows pressure adjustable internally or remotely

Additional equipments in Manual Control Module

Tracking unit	bumpless transfer automatic → manual Setpoint $W_{int.} \rightarrow W_{ext.}$
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Manual-Autom. /Ext.-int. switch with el. feedback signal

Contact	potential-free
Contact loading	max. 24 V, 1 A

Additional equipments in extra module ⁴⁾**Alarm units**

Microswitches	High and low 24 V/2 A
Signalling on x or (x-w) adjustable	0 to 100 %
Switching differential	3 %

I-p Converter for x, $W_{ext.}$

Input	0 to 20 mA/4 to 20 mA
Output	0.2 to 1.0 bar/3 to 15 psi
Input resistance	≤ 220 Ω
Inherent air consumption	≤ 100 l/h
Supply air dependency	≤ 0.25 %/0.1 bar
Rel. instrument error	≤ 0.3 % terminal based conformity ⁵⁾
Hysteresis	≤ 0.1 %
Load effect (m. at 0.6 bar)	+3 % for 200 l/h exhausted flow -3 % for 200 l/h delivered flow
Max. air output	1400 l/h
Temperature effect	≤ 0.3 %/10 K

MODEL CODES (continued)

Additional Module										
without										A
I-P transmitter for x (a)										B
I-P transmitter for Wext. (a)										C
Inductive alarm from -x- (microswitch) (a)										D
Inductive alarm from -xw- (microswitch) (a)										E
Options										
Optionals for manual control unit										
Tracking unit (bumpless switching) auto - manual / Wint.- Wext. (b)										-BT
H - A - switch with electr. feedback signal (f)										-MA
Ext.-int.-switch with electr. feedback signal (b)										-EI
Tag.No. Labeling with inscription										-LL
Optionals for controller										
High limitation (YA+R) (c)										-12
High limitation (R) (d)										-27
Low limitation (YA+R) (c)										-13
Low limitation (R) (d)										-28
Tracking relay (bumpless H - A) (d)										-17
PI-switch, PF internal (d)										-21
PI-switch, PF external (d)										-24
P - PI - change-over (d)										-32
External reset (d)										-35
Auto - selector (d)										-39
Plug for test sleeve(e)										-43
Example:	PC451	-6	A	N	11	C	51	A	-LL	17
Footnotes										
(a) not available with version Code 4					(e) only available with Control mode P / PD					
(b) only with Manual unit Code C					(f) not available with Manual Control Unit Code B					
(c) Limitation of R not available by:	Control mode P,PD,Option Code -32,-35,-39,				Terminal block see EIC2312					
(d) only available with Control mode PI / PID					Housings /Shelves see EIC2312					
					Tube fittings see EOO9001					

MODEL CODES (continued)

Pneumatic Ratio Station Compact P	PM455																
Version																	
Ratio/Cascade		-V															
Multiplication and addition		-M															
Factor set																	
front			1														
inside			2														
Operating point																	
0.2 bar (for ratio)				A													
0.6 bar (for cascade)				B													
0.2 - 1.0 bar adjustable (a)				C													
Signal Range																	
0.2 - 1.0 bar					1												
3 - 15 psi					2												
20 - 100 kPa					3												
Indicating Range for factor V																	
0.5 - 2.0 (linear)						1											
0.7 - 1.4 (square root)						2											
Indicating Range of measured variable W																	
0 - 100% linear							A										
0 - 100% square root							B										
acc. customer specification							C										
Options																	
Plug for test sleeve								-K									
Tag No. Labeling with inscription								-L									
Example:	PM455	-V	1	A	1	1	A	-KL									
<table border="0"> <tr> <td>Footnotes</td> <td>Terminal block</td> <td>see EIC2312</td> </tr> <tr> <td>(a) only available with Version Code M</td> <td>Housings /Shelves</td> <td>see EIC2312</td> </tr> <tr> <td></td> <td>Tube fittings</td> <td>see EOO9001</td> </tr> </table>									Footnotes	Terminal block	see EIC2312	(a) only available with Version Code M	Housings /Shelves	see EIC2312		Tube fittings	see EOO9001
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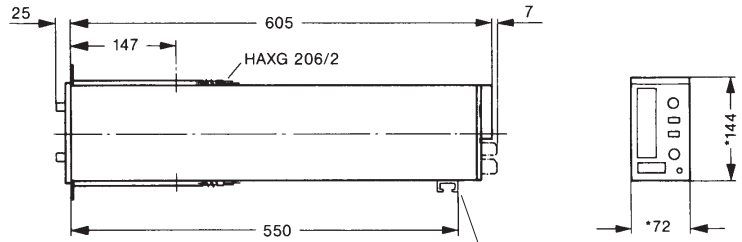
DIMENSIONS

Dimensions in mm

**Pneumatic Controller
Pneumatic Manual Control Station
Pneumatic Ratio Station**

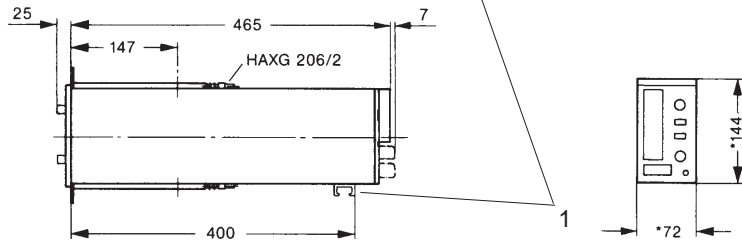
Individual housing

CP 600



Individual housing

CP 400



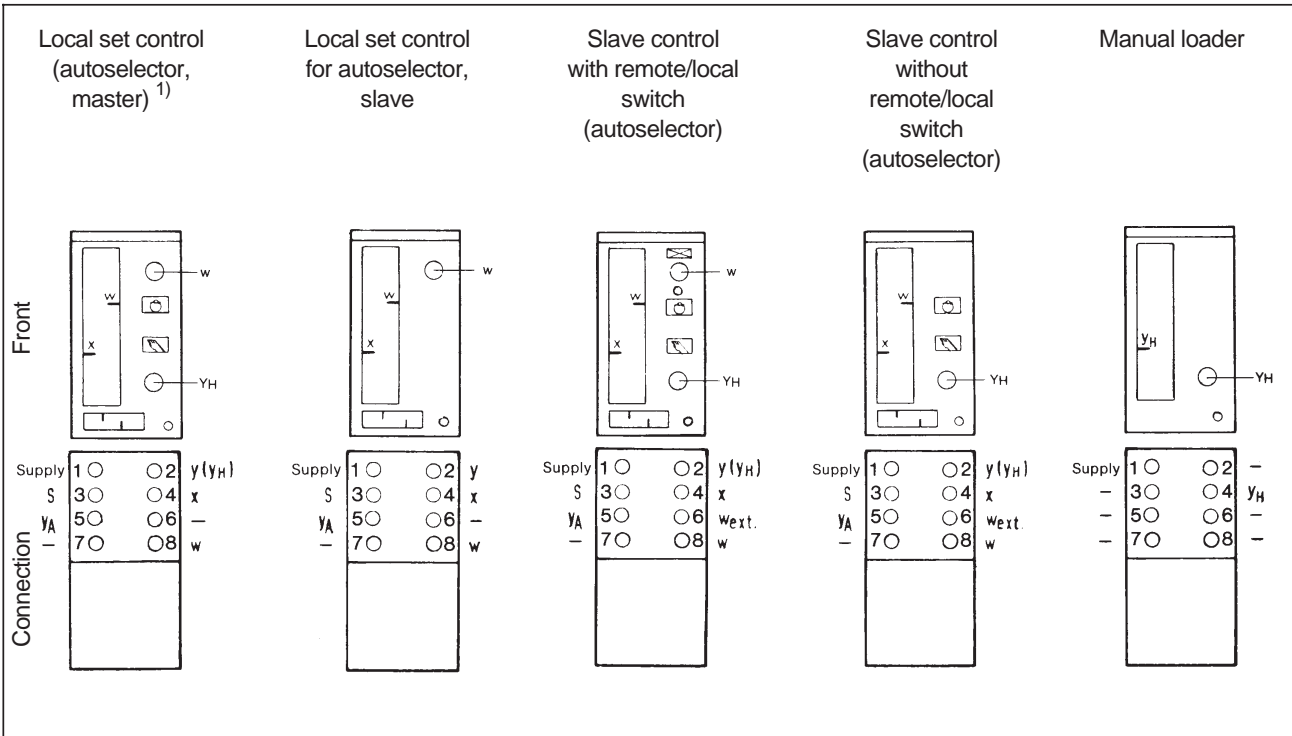
Manual Control Unit CP 200



1) 30 x 15 x 2 recommended profile: Fa. Niedax 2971

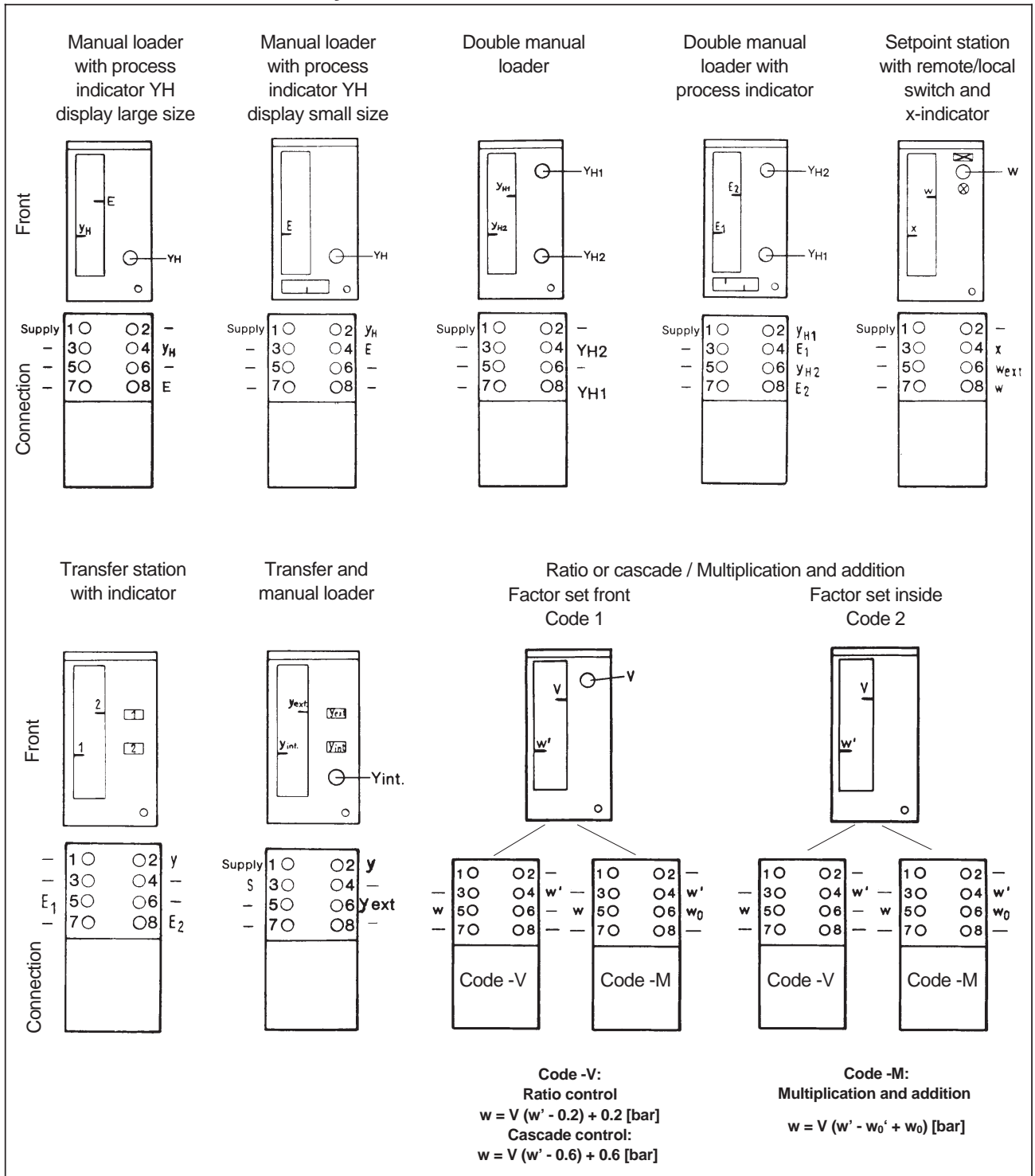
* Nominal dimensions acc. to DIN 43 700

Frontview and connection layout

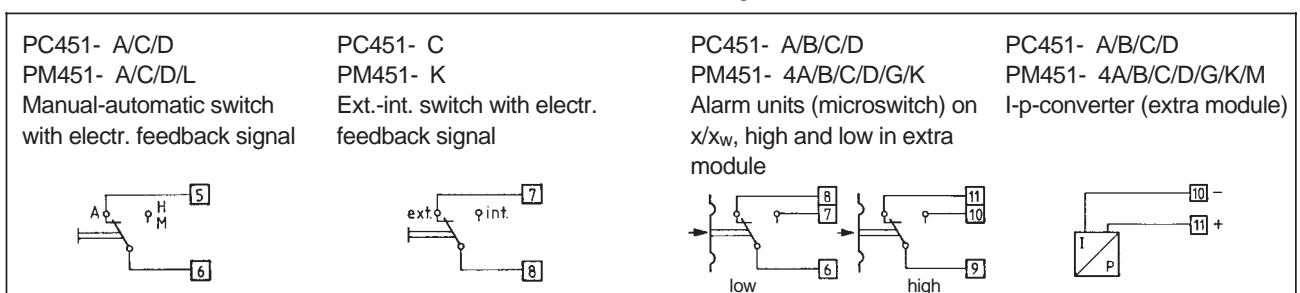


1) Can be used as master controller in auto-selector control loop

Frontview and connection layout (cont.)



Terminal identification of additional electrical components



ACCESSORIES for Compact D/P

GH46 - Housings/Shelves

TG - Accessories for Housing

AT - Terminal block



The housing and shelves common with the terminal parts are used for the mounting of Compact 400/600 devices in panels.

FEATURES

- Easy mounting of compact 400/600 devices
- The modular design allows premounting of the shelves, the multibore band and the terminal blocks. The final mounting can be done later
- The removal of a divider post enables to insert devices of 144 x 144 mm
- Cover plates for space

TECHNICAL DATA

GH46 Housings/Shelves

Dimensions of panel cut-out see page 12

In shelf units can accommodate from 2 to 9 modules 72 mm wide. Removal of a divider post enables one instrument 144 mm wide to be inserted in place of two instruments 72 mm wide

Length compact 400 440 mm
compact 600 580 mm

Mounting panel

Panel mounting bracket . . . acc. to DIN 43834

Materials steel finished

AT Terminal block (Terminal plate with multibore band)

For pneumatic devices flexible multibore band with 8 tubes

For electrical devices flexible electrical flat wire ribbon

Terminal plate aluminum

Pneumatic connections . . . internal thread DIN

45141-Q¹/₈-27NPT

electrical connections screw terminals for 0.5 to

2.5 mm² / flat pins 6.3 x 0.8

TG Accessories for Housing

Cover plate for space and panel cut-outs

Bezel grey RAL 7037

Facia grey RAL 7035

MODEL CODES

Housings /Shelves	GH46	for devices:
compact 400		
1 way housing	-A1M	PR630 (b), PC451, PM451, PM455, AP456, ER550 (b)
2 way housing	-A2M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
3 way housing	-A3M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
4 way housing	-A4M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
6 way housing	-A6M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
8 way housing	-A8M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
9 way housing	-A9M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
compact 600		
1 way housing	-B1M	PR630 (b), PC451, PM451, PM455, AP456, ER550 (b)
2 way housing	-B2M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
3 way housing	-B3M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
4 way housing	-B4M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
6 way housing	-B6M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
8 way housing	-B8M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
9 way housing	-B9M	PR630, PC451, PM451, PM455, AP456, ER550, SP227
Accessories for Housing		
	TG	
Cover plate for empty spaces in housing	-AM	PR630, PC451, PM451 (c), PM455, AP456 (c), ER550
Cover plate for panel cut-outs	-BM	PR630, PC451, PM451, PM455, AP456, ER550
Terminal block		
	AT	
(for el. recorder)		
Universal with screw terminals (only for power supply AC together with integrated transmitter power supply)	-11M	ER550
Single with screw terminals	-29M	ER550
Universal with flat push-on connection (only for power supply AC together with integrated transmitter supply)	-38M	ER550
Single with flat push-on connection	-47M	ER550
(for pneum. recorder)		
Terminal plate with multibore band	-65M	PR630
(for pn. controller / manual units)		
Terminal plate with multibore band (without electr. accessor.)	-19M	PC451, PM451 (c), PM455
Terminal plate with multibore band (with electr.accessor.: screw terminals)	-27M	PC451, PM451 (c)
Terminal plate with multibore band (with electr.accessor.: flat pins)	-28M	PC451, PM451 (c)
Terminal plate with multibore band (without electr. accessor.)	-46M	PM451 (a) (c)
Terminal plate with multibore band (with electr.accessor.: screw term.)	54M	PM451 (a) (c)
Terminal plate with multibore band (with electr.accessor.: flat pins)	-55M	PM451 (a) (c)
(for pn.indicator)		
Terminal plate with multibore band (without electr. accessor.)	-61M	AP456 (c)
Terminal plate with multibore band (with electr.accessor.: screw terminals)	-88M	AP456 (c)
Terminal plate with multibore band (with electr.accessor.: flat pins)	-97M	AP456 (c)

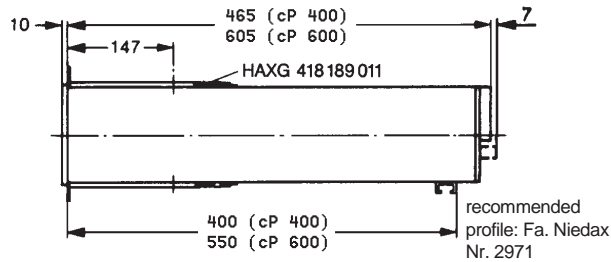
Footnotes
 (a) only available with version Code -4 and additional module Code B, C, D, E and GH46-A*
 (b) not available with version Code -B
 (c) not available with version Code -2

DIMENSIONS

Dimensions in mm

Individual housing

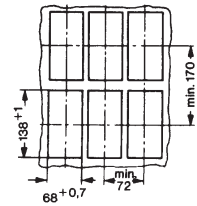
CP 600 / CP 400



Panel cut-out

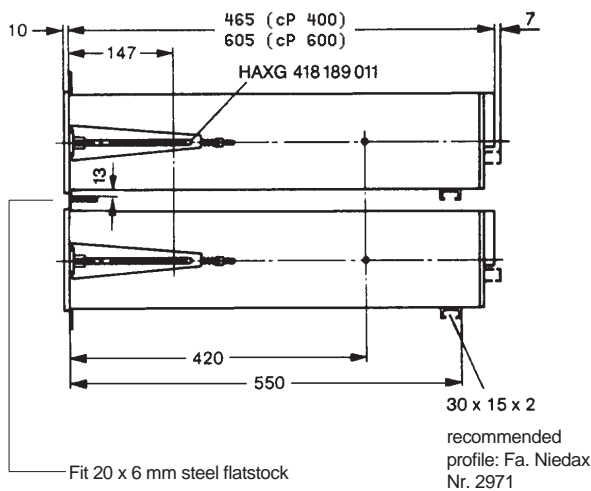
Individual housing

Cut-out dimensions according to DIN 43 700
Side-by-side mounting in a common panel cut-out is possible. The overall cut-out length is accordingly the sum of the nominal dimensions (72 mm) of each unit involved, less 4 mm (tolerance + 1mm)

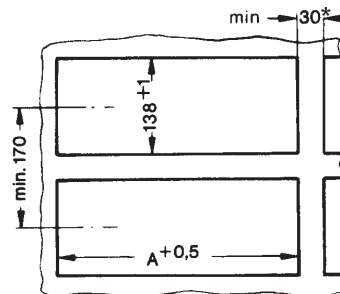


Shelf

CP 600 / CP 400



Shelf



Instr. per shelf	Dim. A
2	141
3	214
4	287
6	433
8	579
9	652

* Deleted when installing close up to each other. The overall cut-out length is therefore the sum of the "A" dimensions for each shelf unit plus 6 mm allowance between each adjoining shelf unit.

Fit 20 x 6 mm steel flatstock

When installing close up to each other, fit panel mounting brackets top and bottom as for individual housings.

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