

Pulse Scaler for DIN Rail Attachment



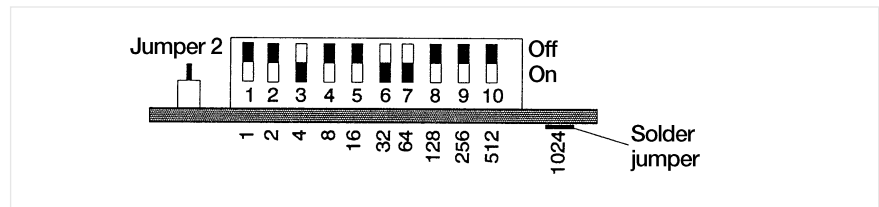
PROGRAMMING

- Programmable pulse scaling factor up to 2047:1
- NAMUR generator input
- PNP transistor output
- Max. pulse frequency 5 kHz
- 35 mm DIN rail attachment

The divisor is set in binary code by means of DIL switches. To obtain a divisor value of 100, e.g. switches S7, S6, and S3 must be set (100 = 64 + 32 + 4).

Programming the signal duration

Ordering code 0 651 109: 0.2 ... 1 ms (jumper 2 open) or 20 ... 100 ms (jumper 2 closed) Ordering code 0 651 114: 1 ... 20 ms (jumper 2 open) or 100 ms ... 2s (jumper 2 closed).



TECHNICAL DATA

Supply voltage V_{op}	10 ... 30 VDC \pm 10 %
Current consumption	< 10 mA
Operating temperature	- 10 ... + 60 °C
Storage temperature	- 20 ... + 70 °C
Electrical connection	screw terminals
Mounting	35 mm DIN rail attachment
Protection class (IEC 144)	IP 50, connections IP 00
Vibro-stability	50 m/s ² acc. to IEC 068-2-6
General design	acc. to DIN VDE 0411

Inputs

Amplitude thresholds	< 2 V and > 8 V or NAMUR
Active edge	positive or NAMUR
Pulse shape	random (squarewave 1:1 for max. frequency)
Input resistance	approx. 5 k Ω

Count input

Min. pulse duration	> 100 μ s (5 kHz), 17 ms (30 Hz)
Max. counting frequency	5 kHz or 30 Hz

Control input

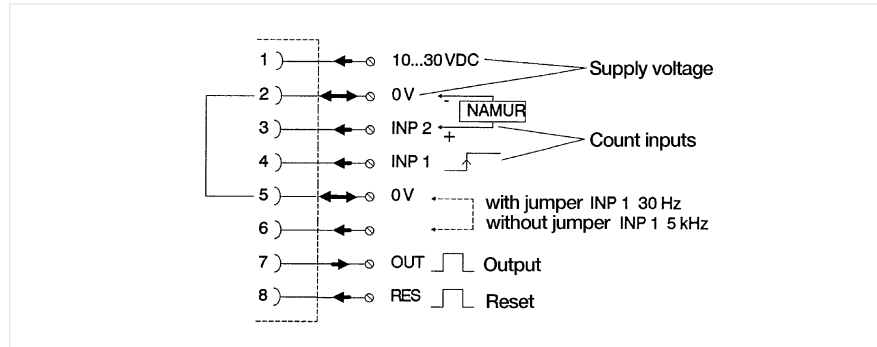
Reset	- external pulse, pulse length > 17 ms - by switching the supply voltage off and on (start-up reset)
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Output

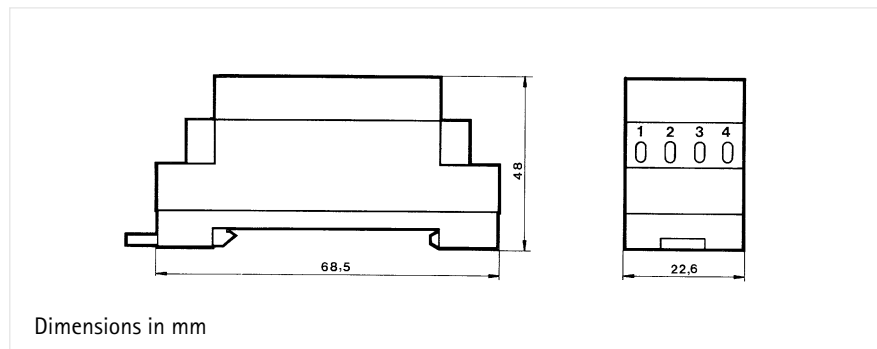
Signal type	PNP
Signal duration	Ordering code 0 651 109, 0.2 ... 1 ms or 20 ... 100 ms Ordering code 0 651 114, 1 ... 20 ms or 100 ms ... 2 s
Switching voltage	approx. V_{op}
Switching current	100 mA

Technical data

CONNECTION DIAGRAM



DIMENSIONED DRAWING



ORDER INFORMATION

Setting range of the output impuls		
Input	max. 100 ms	max. 2 s
PNP	0 651 109	--
PNP and NAMUR	0 651 108	0 651 114

Attention:

If Version 0 651 108 or 0 651 114 is operated with the PNP input INP 1, then the NAMUR input INP 2 must be connected to 0 V. The simultaneous use of both inputs is not possible!

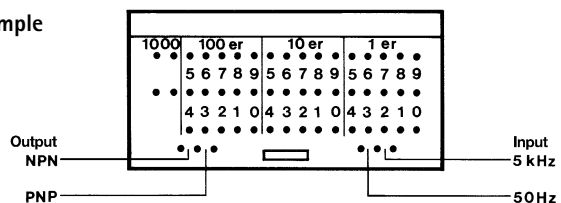
Plug-in Pulse Scaler for Modular System 400



PROGRAMMING

- Programmable pulse scaling factor up to 1000:1
- NAMUR generator input
- NPN or PNP transistor output
- Max. pulse frequency 5 kHz
- Integrated in modular system 400

Programming example



Division factor, input attenuation and output mode are programmed with jumpers located behind the front panel.

TECHNICAL DATA

Supply voltage V_{Op}	24 VDC \pm 15 %
Current consumption	10 mA
Value retention	none
Operating temperature	- 10 ... + 50 °C
Storage temperature	- 20 ... + 70 °C
Electrical connection	AMP connectors 0.8 x 2.8 mm, via connection box
Mounting	modular system 400
Protection class (IEC 144)	front IP 20, connection IP 00
Vibro stability	50 m/s ² acc. to IEC 068-2-6
General design	acc. to DIN VDE 0411
Weight	approx. 50 g

Inputs

Amplitude thresholds	< 2 V and > 8 V max. + 30 VDC
Active edge	positive
Pulse shape	random (squarewave 1:1 for max. frequency)
Input resistance	5.6 k Ω

Count input

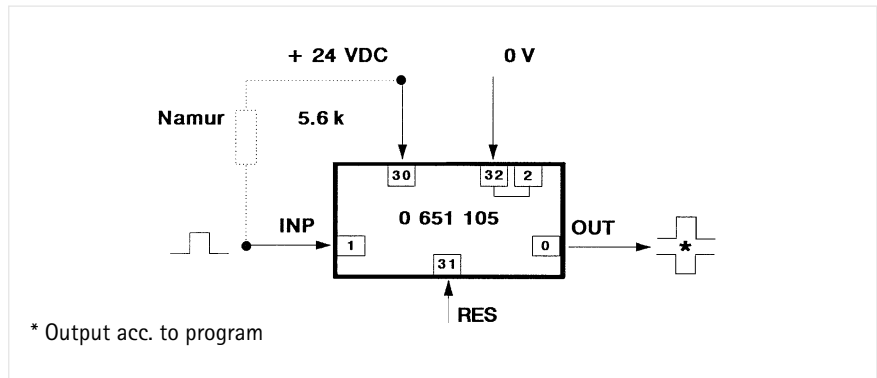
Min. pulse duration	20 μ s at 5 kHz, 200 μ s at 50 Hz
Max. counting frequency	5 kHz/50 Hz, programmable
Control input	static behaviour
Reset	- manual with button - via reset pulse input, min. pulse length 10 ms - by switching the supply voltage off and on (start-up reset)

Output

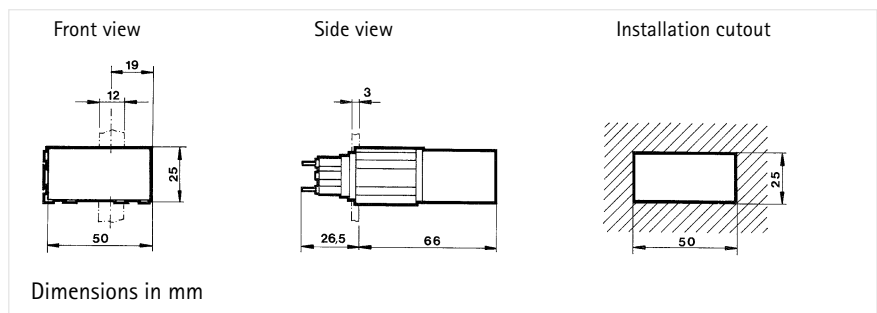
Signal type	PNP or NPN, programmable
Signal duration	approx. 25 ms
Switching voltage	$V_{Op}/0$ V, depending on program
Switching current	400 mA
Max. frequency	20 Hz

Technical data

CONNECTION DIAGRAM



DIMENSIONED DRAWING Pulse scaler with connection box



ORDER INFORMATION

Pulse scaler	Ordering code 0 651 105
Standard accessories	
Connection box	Ordering code 1 405 566
Connection box for NAMUR generator	Ordering code 1 651 074
Panel frame, black	Ordering code 1 405 491

Type 654



TYPICAL APPLICATIONS

TECHNICAL DATA

DIMENSIONED DRAWING

Pulse Amplifier for DIN Rail Attachment

- Input NPN or PNP
- Output NPN or PNP
- For electromechanical or electronic counters
- 35 mm DIN rail attachment

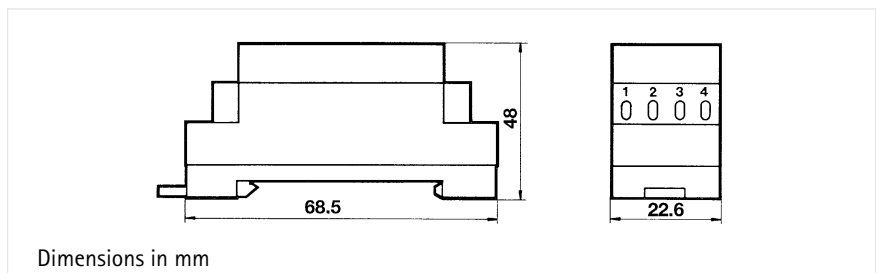
- Pulse amplifier for weak signals
- Inverter when PNP signals are to be converted into NPN signals (or vice versa)

Supply voltage V_{op}	10 ... 30 VDC
Current consumption	= switching current < 300 mA
Residual ripple	< 5 %
Operating temperature	- 10 ... + 50 °C
Storage temperature	- 20 ... + 70 °C
Electrical connection	screw terminals
Mounting	35 mm DIN rail attachment
Mounting position	any
Protection class (IEC 144)	IP 50, connections IP 00

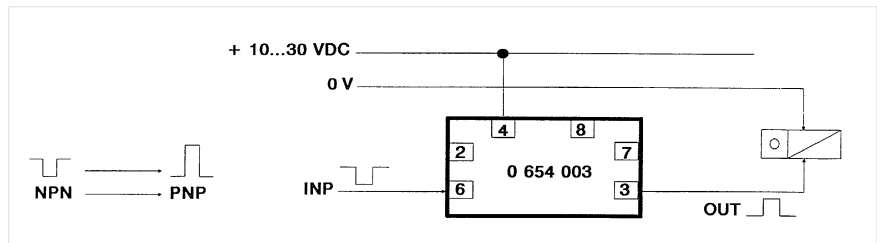
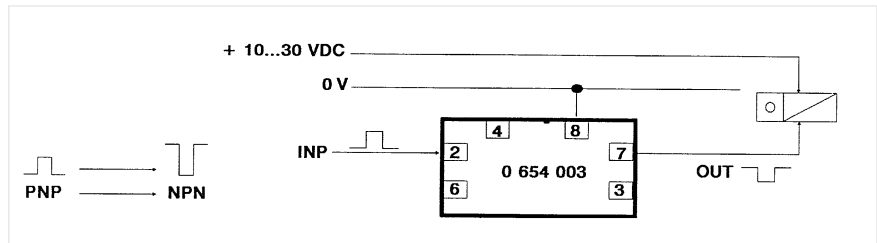
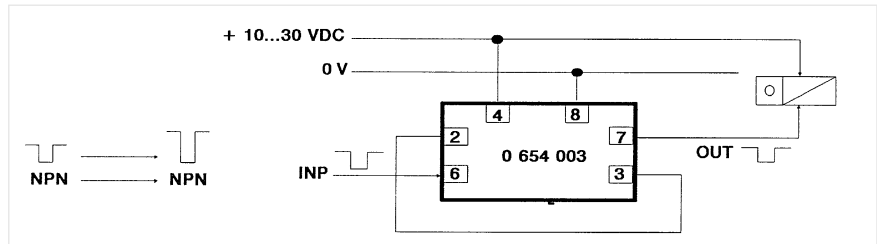
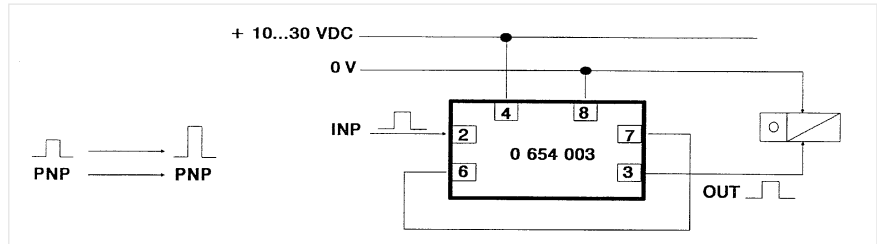
Input	
Amplitude thresholds	> 5.5 VDC or < with ext. resistor
Active edge	PNP or NPN
Pulse shape	random
Input resistance	2.2 kΩ
Min. pulse duration	1 μs
Max. counting frequency	1 MHz

Output	
Signal type	PNP or NPN
Signal duration	= input pulse
Switching voltage	PNP V_{op} (- 1V), NPN 0 V (+ 1 V)
Switching current	max. 300 mA

Note: For actuation of electronic counters an additional load resistor of 1 kΩ must be connected in parallel to the count input



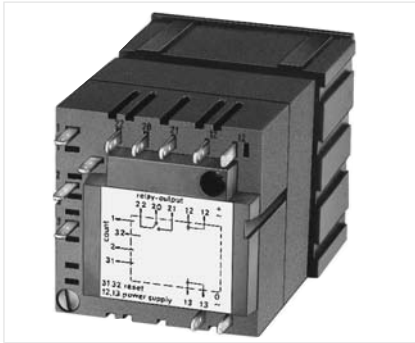
CONFIGURATION EXAMPLES



ORDER INFORMATION

Pulse amplifier Ordering code 0 654 003

Continuous Duty Module for Electrical Reset



- Continuous duty module for preset counters 446, 447, 486, 487 and preset time counter 489
- Plugs into modular system 400
- Integrated connection box

TECHNICAL DATA

Supply voltage V_{Op}	acc. to order information
Power consumption	DC version 12 W, AC version 16 VA
Operating temperature	- 10 ... + 50 °C
Electrical connection	AMP connector 0.8 x 2.8 mm
Mounting	modular system 400
Protection class (IEC 144)	IP 00
Maintenance-free operation	1.5 x 10 ⁶ resets
General design	acc. to DIN VDE 0435

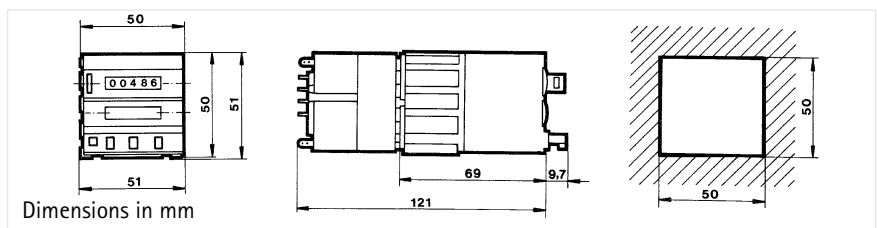
Input

Signal duration	min. 15 ms, max. 100 % duty cycle
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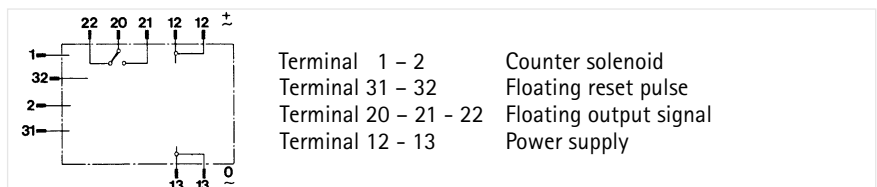
Output

Signal duration	250 ms
Contact type	floating changeover contact
Switching voltage	max. 220 V
Switching current	max. 20 VA/1 A
Reset frequency	DC version max. 1 per 2 s, AC version max. 1 per 3 s

DIMENSIONED DRAWING Continuous duty module with preset counter



CONNECTION DIAGRAM TERMINAL ASSIGNMENT



ORDER INFORMATION

Supply voltage	Ordering code	Supply voltage	Ordering code
24 VDC	1 486 420	115 VAC	1 486 421
24 VAC	1 486 423	220 VAC	1 486 422

Inquire for other voltages

Note: When this module is used, the counter no longer requires a connection box.

Automatic Reset Module for Preset Counters



- Automatic reset for preset counters 446, 447, 486, 487 and preset time counter 489 with electrical reset
- Plugs into modular system 400
- Integrated connection box

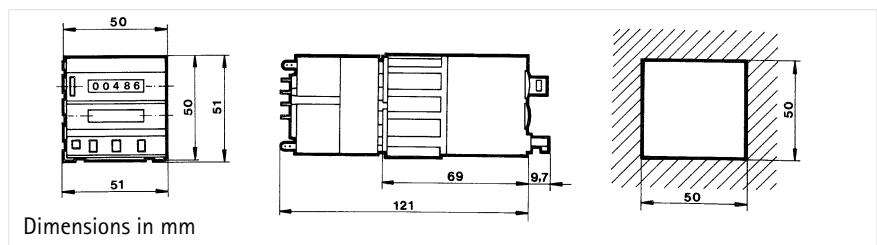
TECHNICAL DATA

Supply voltage V_{op}	acc. to order information
Power consumption	DC version 12 W, AC version 16 VA
Operating temperature	- 10 ... + 50 °C
Electrical connection	AMP connector 0.8 x 2.8 mm
Mounting	modular system 400
Protection class (IEC 144)	IP 00
Maintenance-free operation	1.5 x 10 ⁶ resets
General design	acc. to DIN VDE 0435

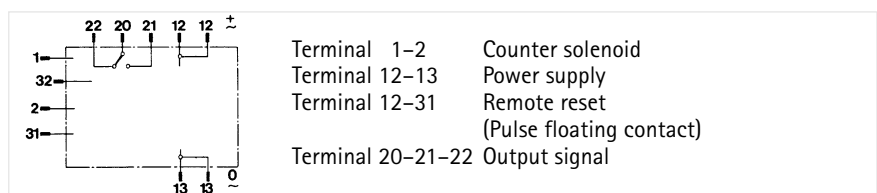
Output

Signal duration	DC version approx. 200 ms, AC version approx. 250 ms
Contact type	floating changeover contact
Switching voltage	max. 220 V
Switching current	max. 20 VA/2.5 A
Reset frequency	DC version max. 1 per s, AC version max. 1 per 2 s

DIMENSIONED DRAWING Automatic reset module with preset counter



CONNECTION DIAGRAM TERMINAL ASSIGNMENT



ORDER INFORMATION

Supply voltage	Ordering code	Supply voltage	Ordering code
24 VDC	1 486 402	115 VAC	1 486 412
24 VAC	1 486 409	220 VAC	1 486 413

Inquire for other voltages

Note: When this module is used, the counter no longer requires a connection box.

Typ 711



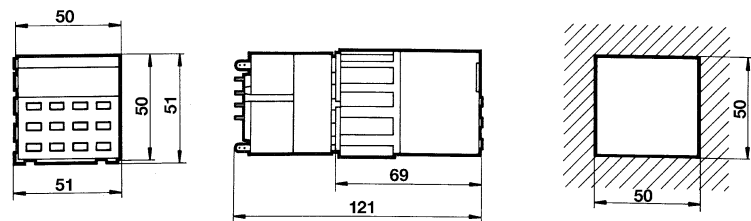
TECHNICAL DATA

- For electronic preset counters type 711 and 781.4
- With integrated connection box

Supply voltage V_{Op}	110 or 220 VAC, depending on version
Electrical connection	AMP connector 0.8 x 2.8 mm
Mounting	modular system 400
Mounting position	any
Protection class (IEC 144)	IP 00
General design	acc. to DIN VDE 0411

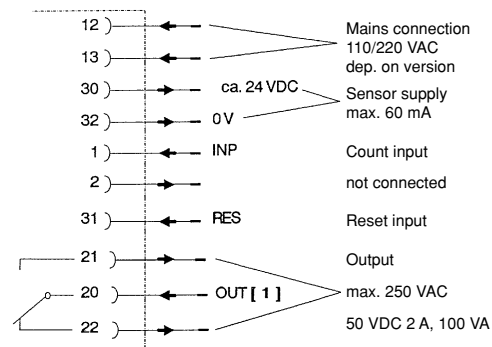
Output	
Sensor supply	24 VDC, max. 60 mA

DIMENSIONED DRAWING Counter with power supply unit



Dimensions in mm

CONNECTION DIAGRAM



ORDER INFORMATION

Version	110 VAC	220 VAC
Power supply unit	1 711 011	1 711 010

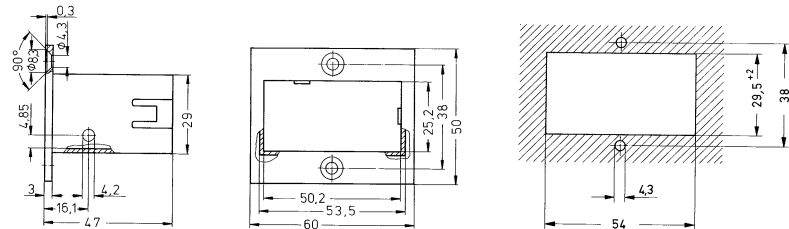
Note: If this module is used, the counter no longer requires a separate connection box.

Panel Frames for Hengstler Modular System 400



Size 1

Attachment by two countersunk screws M4



Plastic, black
Plastic, grey

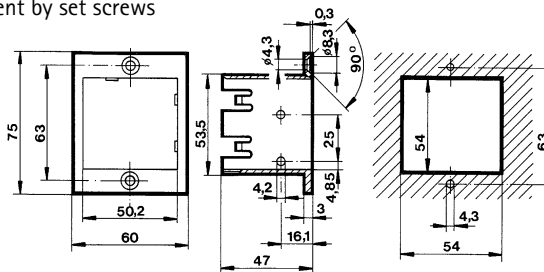
Ordering code 1 405 491
Ordering code 1 405 452

Dimensions in mm



Size 2

Attachment by set screws



Plastic, black
Plastic, grey

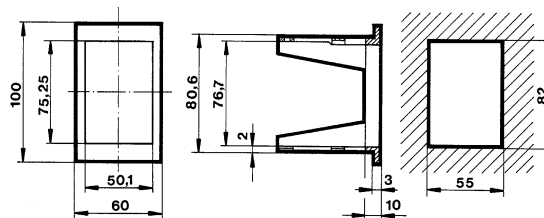
Ordering code 1 405 492
Ordering code 1 405 453

Dimensions in mm



Size 3

Attachment by set screws



Die-cast
Textured paint, matt black
silver

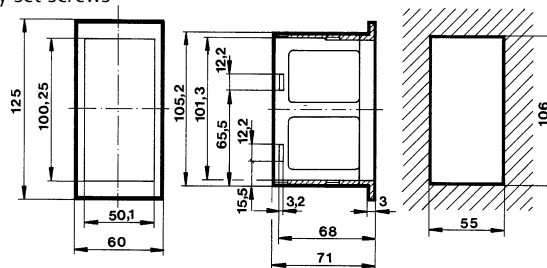
Ordering code 1 405 010
Ordering code 1 405 009

Dimensions in mm



Size 4

Attachment by set screws



Sheet steel
Textured paint, matt black

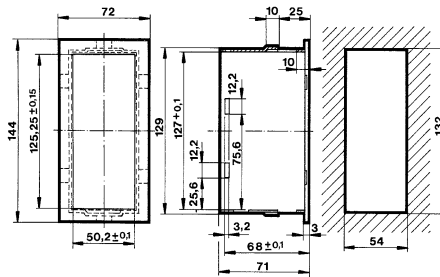
Ordering code 1 405 093

Dimensions in mm

Panel Frames for Hengstler Modular System 400



Attachment
by set screws

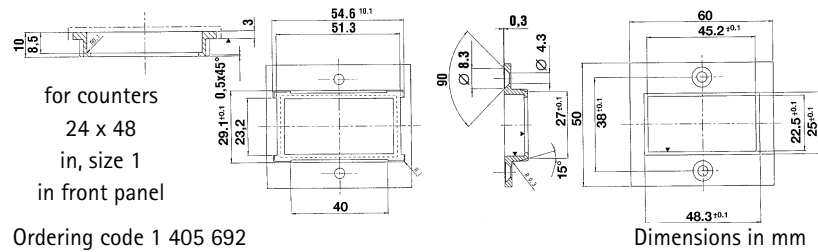


Die-cast

Textured paint, matt black Ordering code 1 405 493

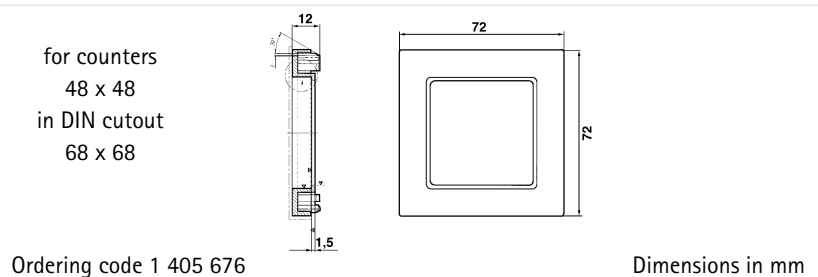
Dimensions in mm

Panel Frames "signo" + "tico"



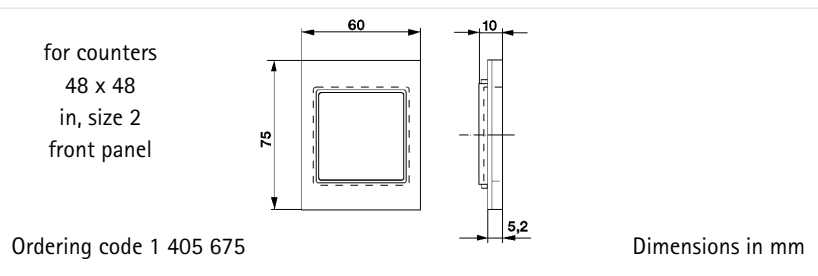
Ordering code 1 405 692

Dimensions in mm



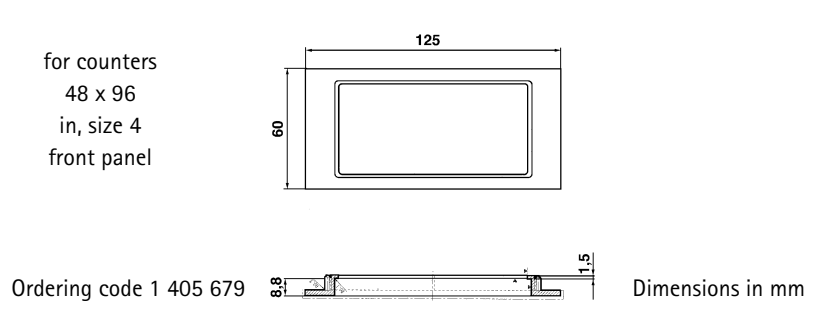
Ordering code 1 405 676

Dimensions in mm



Ordering code 1 405 675

Dimensions in mm



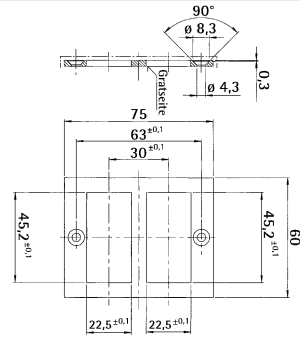
Ordering code 1 405 679

Dimensions in mm

Panel Frames for Hengstler Modular System 400



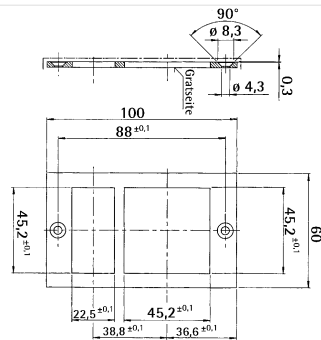
2 counters
24 x 48 mm
in
front panel size 2



Order-Nr. 1 405 696



1 counter 24 x 48 mm
1 counter 48 x 48 mm
in
front panel size 3



Order-Nr. 1 405 693

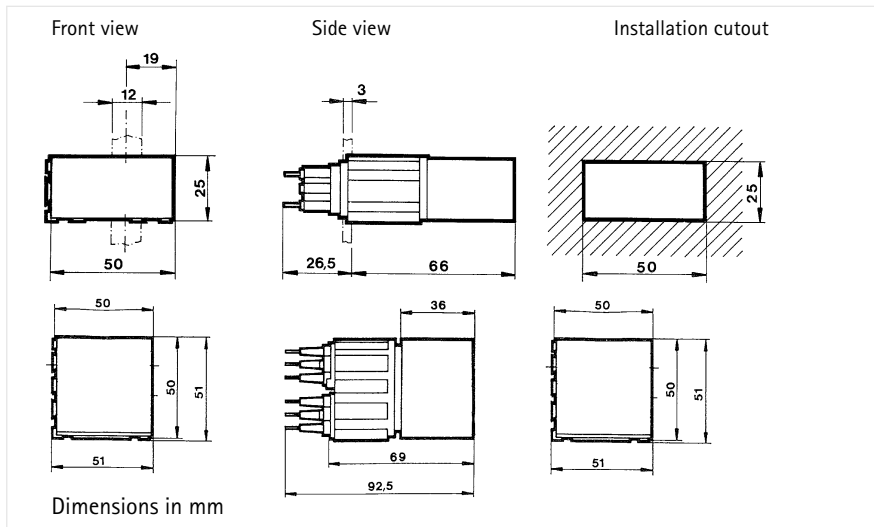


DIMENSIONED DRAWING SIZE 1
Dummy cap with attachment socket



■ For filling a prepared counter cutout

DIMENSIONED DRAWING SIZE 2
Dummy cap with attachment socket



ORDER INFORMATION

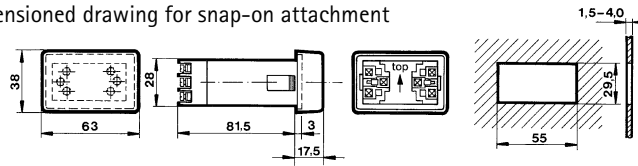
Dummy cap size 1	Ordering code 2 651 009
Dummy cap size 2	Ordering code 1 651 018

Protective Cases with Screw Terminal Connection

Size 1



Dimensioned drawing for snap-on attachment

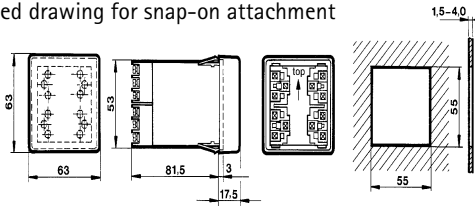


Colour: light grey Ordering code 1 405 588 Spare cover Ordering code 2 405 191*
Colour: black Ordering code 1 405 641 Dimensions in mm

Size 2

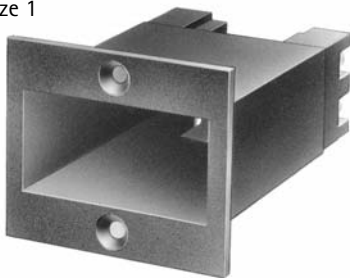


Dimensioned drawing for snap-on attachment

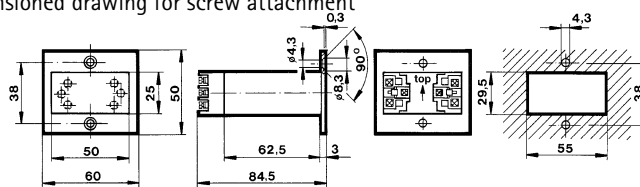


Colour: light grey Ordering code 1 405 666 Spare cover Ordering code 2 405 192*
Colour: black Ordering code 1 405 668 Dimensions in mm

Size 1



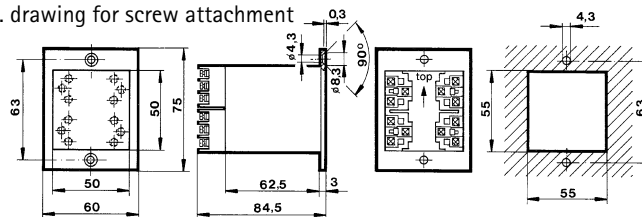
Dimensioned drawing for screw attachment



Colour: light grey Ordering code 1 405 562
Colour: black Ordering code 1 405 640 Dimensions in mm

Size 2

Dimens. drawing for screw attachment



Colour: light grey Ordering code 1 405 667
Colour: black Ordering code 1 405 669 Dimensions in mm

* On request

TECHNICAL DATA

Case	fibreglass-reinforced plastic
Transparent cover	see "Accessories - transparent covers"
Mounting	screw or snap-on attachment, dep. on version
Connection	screw terminals on the rear of the case
Protection class (IEC 144)	- screw-mounted case IP 00, with mounted transparent cover: front IP 65, connections IP 00 - case with snap-on attachment: front IP 52, connections IP 00

Sealing Covers • Transparent Covers with Protection to IP 65



Flexible Vestolit sealing cover with metal frame for panel frames or protective cases size 1-2.

The sealing set enables you to operate a counter through the cover.

Parts supplied:

Sealing set including metal frame, cover and retaining screws.

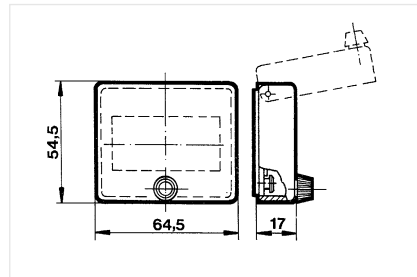


Size 1

for screwed front panel 60 x 50 mm
Ordering code 1 405 615, silver colour

Size 2

for screwed front panel 60 x 75 mm
Ordering code 1 405 404, silver colour
Ordering code 1 405 587, black



Size 1

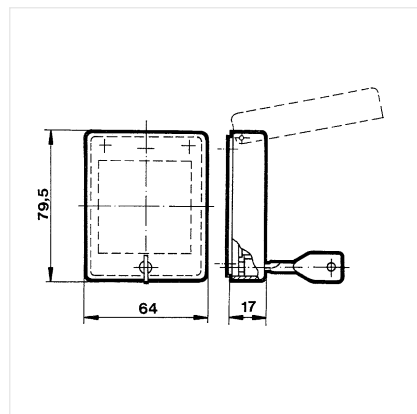
for screwed front panel 60 x 50 mm

with knob

Ordering code 1 405 611

with key lock

Ordering code 1 405 612



Size 2

for screwed front panel 60 x 75 mm

with knob

Ordering code 1 405 613

with key lock

Ordering code 1 405 614

Transparent covers together with the fitting panel frame or protective case offer protection against dust and water from the front for switch-panel incorporation.

Protection class IP 65 acc. to DIN 40 050.

Transparent covers are made of makrolon, seals are made of synthetic rubber.

Parts supplied:

Transparent covers including seals.

1 key per unit for versions with lock.

Type 680

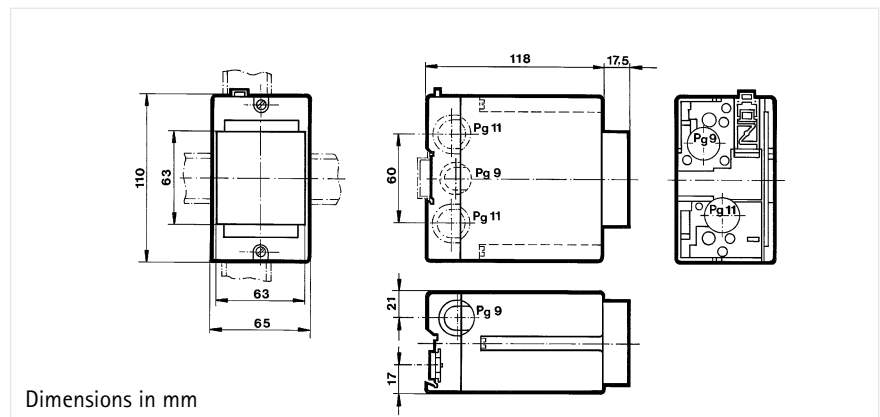


TECHNICAL DATA

- Attachment by means of 35 mm DIN rail or with screws
- Case made of insulating material
- Installation of counters of the modular system 400 in protective case size 2

Case	ABS plastic
Colour	grey
Resistance to heat	up to 85 °C
Burning properties	VDE 0304 part 3/5.70, degree IIIa
Mounting	- snap-on attachment to 35 mm DIN rail (DIN 46277/DIN EN 5022), lengthwise or crosswise - screw-mounting 2 x M4 or M5
Connection	by cable, cable inlet with PG-cable gland or feed-through

DIMENSIONED DRAWING



ORDER INFORMATION

Case (without counters) Ordering code 1 680 089

Delivery includes case compl. with protective case size 2 (12-way connectors) without counters.

Measuring Wheels

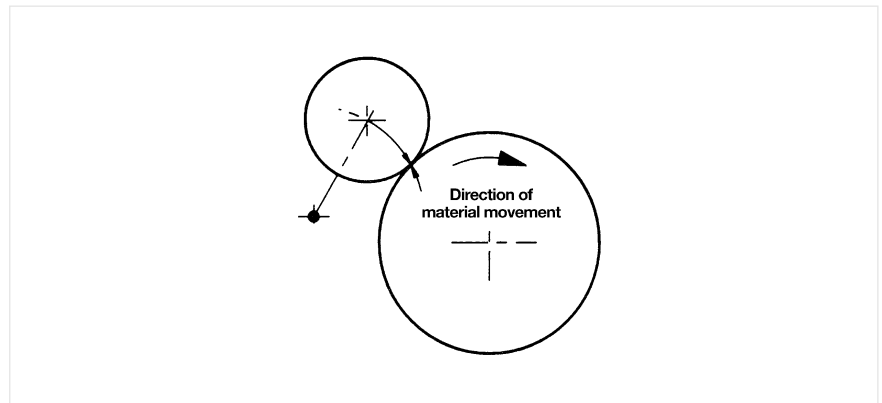
APPLICATION

In order to avoid errors when using measuring wheel actuation, it is important that the slip is kept as low as possible. When choosing a profile (surface structure), special attention must be given to the properties the material being measured, such as elasticity, thickness and interaction resistance. Slippage is also influenced by the width of the contacting measuring wheel, the pressure of

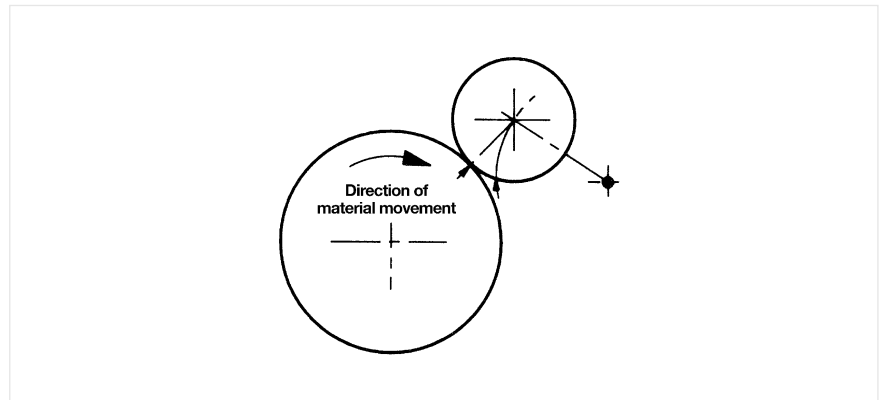
contact, the tensile stress in the material that is being measured and the angle of wrap. The angle of wrap should be as large as possible. Wheel bodies are made of cast metal or plastics (see designation).

The position of the measuring wheel should be chosen such that the material moves away from the bearing of the sensor.

CORRECT MEASURING WHEEL OR PULSE GENERATOR



WRONG MEASURING WHEEL OR PULSE GENERATOR



MEASURING WHEEL CIRCUMFERENCE/ TRANSMISSION RATIO

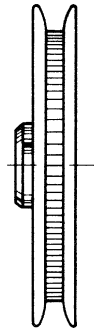
Use the following measuring wheels for different transmission ratios of counters:

Counter transmission ratio	measuring wheel circumference
500:1	0.2 m (1/5 yd.)
50:1	0.2 m (1/5 yd.)
5:1	0.2 m (1/5 yd.)
2:1	0.5 m (1/2 yd.)
1:2	0.2 m (1/5 yd.)
1:5	0.5 m (1/2 yd.)
1:20	0.2 m (1/5 yd.)

Measuring Wheels

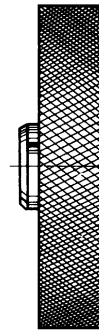
OVERVIEW

Profile 1



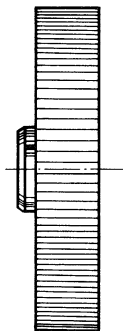
1 with rims, aluminium with fine cross knurling
Used e.g. for threads and yarns

Profile 2



2 Rubber profile, glued on
Used e.g. for paper and cardboard, cable measurement, non-greasy metal, fleece, wood (rough or finished), soft and hard plastic materials;
A = soft, highly adhesive rubber coating
B = good-grip, low-wear rubber

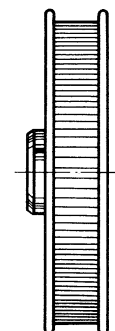
Profile 3/4



3 Rubber coating with parallel knurling, vulcanized
Used e.g. for rubber, leather, textiles, floorings, glass

4 Aluminium with parallel knurling
Used e.g. for rubber, soft plastic materials, wood with rough surface, certain textiles

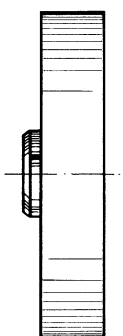
Profile 5



5 With rims, aluminium with parallel knurling
Used e.g. for threads, yarns, ribbons

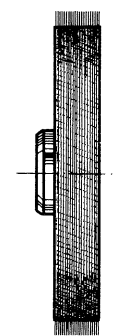
MEASURING WHEEL circumference/transmission ratio

Profile 6



6 Plastic coated
Used e.g. for wire, greased metals, steel profiles

Profile 7



7 Card band
Used e.g. for carpets and coarse textiles

Measuring Wheels

ORDER INFORMATION Aluminium

PLASTIC

Technical data

Circumf.	Profile	Width of contact surf. mm	Bore \varnothing			
			4.0 mm	6.0 mm	7.0 mm	10.0 mm
0.2 m	1	4	0 601 014	0 601 015	0 601 017	--
	2 A	12	0 601 018	--	--	--
	2 B	12	0 601 118	0 601 048	--	0 601 049
	2 A	24	0 601 020	--	0 601 092	--
	2 B	24	--	--	0 601 192	--
	4	20,5	0 601 023	--	--	--
	4	20	--	--	0 601 093	--
	5	16,5	0 601 026	--	0 601 094	--
0.5 m	2 A	25	--	--	0 601 050	--
	2 B	--	--	--	0 601 150	0 601 151
	3	25	--	--	0 601 059	0 601 156
	4	25	--	--	0 601 121*	0 601 157
	5	16	--	--	0 601 052	--
	6	25	--	--	0 601 063*	0 601 163
	7	26,5	--	--	--	--
1/5 yd.	1	4	0 601 034	--	0 601 037	--
	5	16,5	--	--	0 601 096	--
1 Fuß	2 A	25	--	--	0 601 071	--
	2 B	25	--	--	0 601 171	--
0.2 m	1	4	0 601 100	--	--	--
0.5 m	4	25	--	--	0 601 301	--
	6	25	--	--	0 601 300	--

* meets PTB requirements

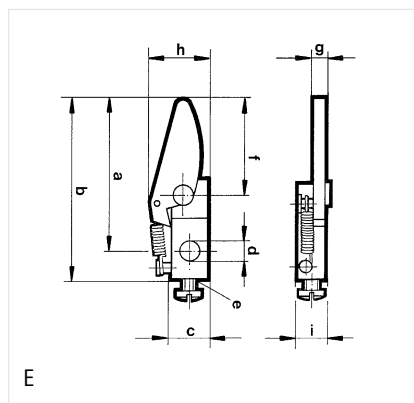
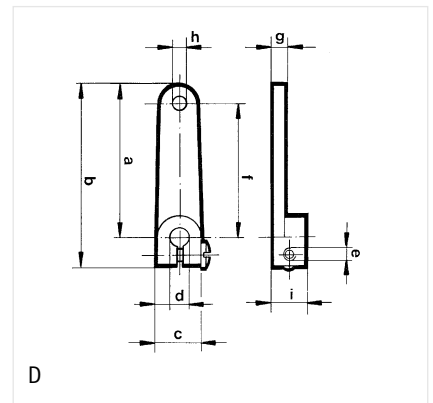
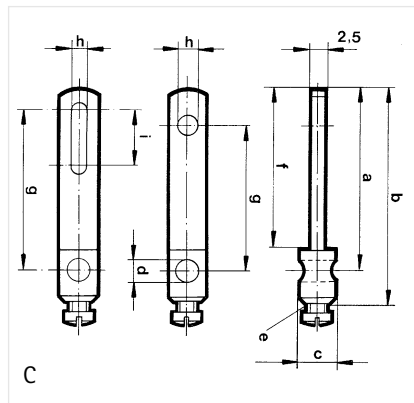
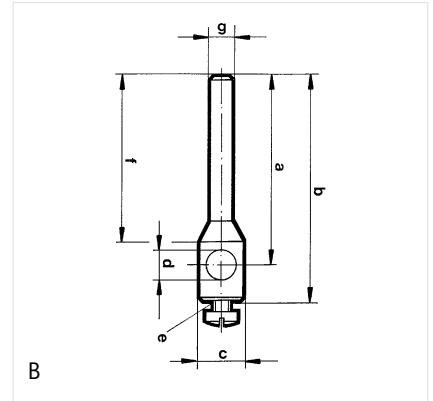
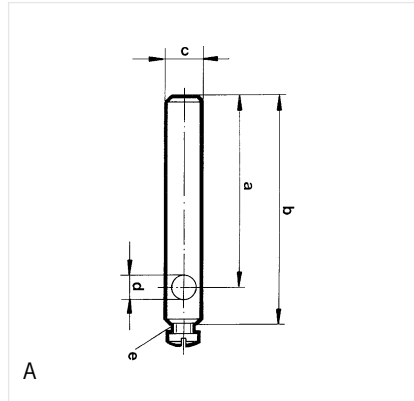
Inquire for other measuring wheels

Stroke Levers

OVERVIEW

This overview shows different kinds of levers available. The stroke levers are not supplied with the counters and must be ordered separately.

A "standard lever" is stated with the order information for mechanical stroke counters.



Stroke Levers

DIMENSION TABLE

Technical data

Ordering code	a	b	c	d	e	f	g	h	i
0 600 003	34	40.5	∅ 8	∅ 5	M 3	29.5	∅ 4	--	--
0 600 005	45	55	∅ 10	∅ 7	M 4	41	∅ 5	--	--
0 600 007	26	31.5	∅ 7	∅ 3	M 2.6	21.2	--	--	--
0 600 009	22	28	∅ 7	∅ 4	M 4	18	18	3	11
0 600 010	28.7	33.7	8	∅ 3	M 2.6	25.4	1.8	2.5	5.5
0 600 012	28.2	33.5	7	∅ 3	M 2.6	17.8	2	10.7	5
0 600 013	28.2	33.5	7	∅ 4	M 4	17.8	2	10.7	5
0 600 026	35.5	41.5	∅ 7	∅ 4	M 4	31.5	∅ 3.5	--	--
0 600 047	27.5	35	7	∅ 4	M 3	24	2.5	2	6
0 600 061	22	28	∅ 7	∅ 4	M 4	18	15	3	--
0 600 090	33	39.5	∅ 8	∅ 5.5	M 4	28.5	∅ 4	--	--
0 600 126	35	41.5	∅ 6	∅ 4	M 4	--	--	--	--

ORDER INFORMATION

Bore ∅ mm	A	B	Shape C	D	E
3	--	--	0 600 007	0 600 010	0 600 012
4	0 600 126	0 600 026	0 600 009*	0 600 047*	0 600 013
4	--	--	0 600 061*	--	--
5	--	0 600 003	--	--	--
5.5	--	0 600 090	--	--	--
7	--	0 600 005	--	--	--

* on request
Inquire for other stroke levers

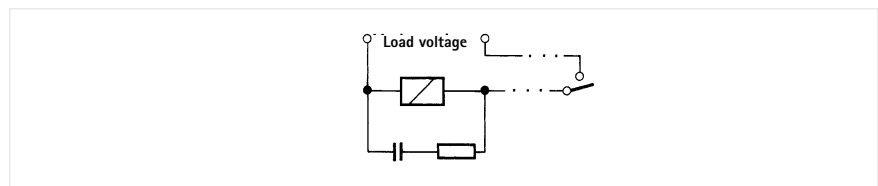
Spark Quenching

Loads operated directly by the counter, such as contactors, solenoids etc., produce a very high inductive voltage when they are switched off. This leads to sparking at the switch contacts and causes contact burning, thus reducing the lifetime or the inte-

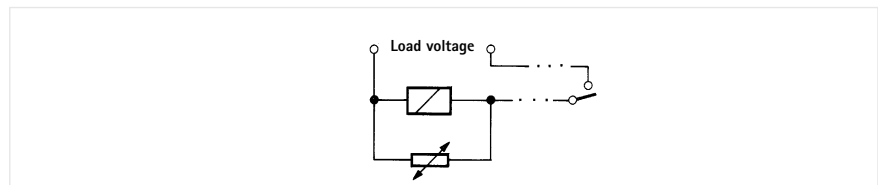
grated relay. Voltage peaks may also cause interfering pulses.

Therefore we recommend to adopt one of the following spark quenching measures for inductive loads.

RC UNIT
For contactors, solenoids etc.



VARISTOR
For small relays



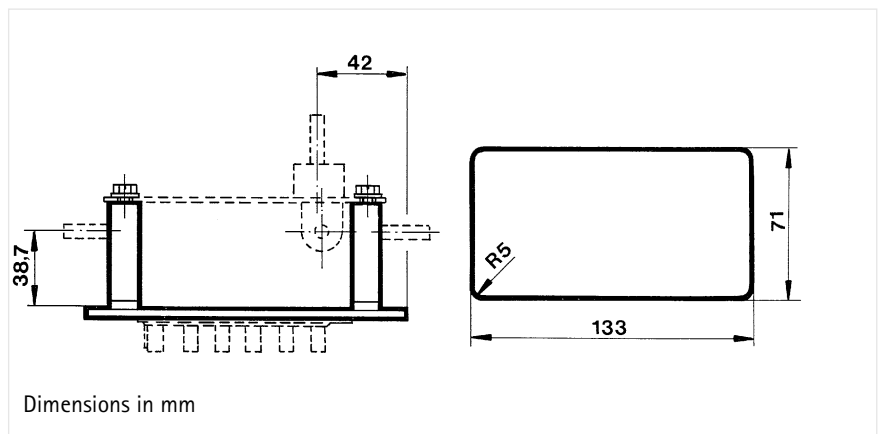
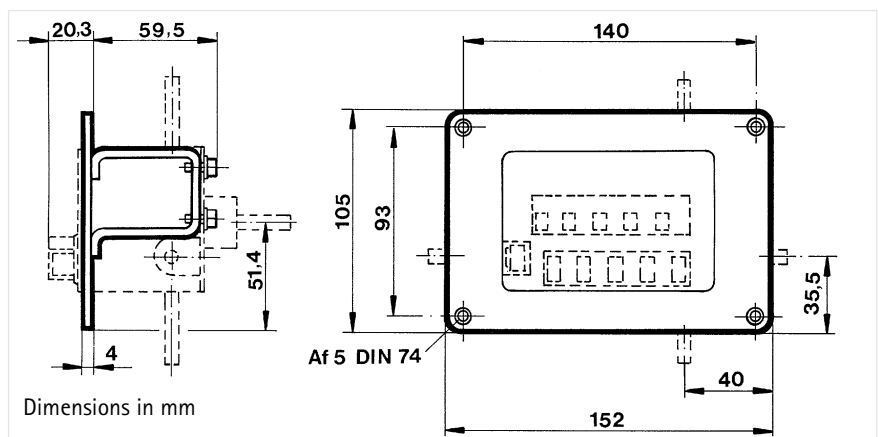
ORDER INFORMATION

RC unit	Ordering code 3 536 801
Varistor	Ordering code 3 540 777

Mounting Frame



DIMENSIONED DRAWING



This mounting frame is designed for the installation of mechanical counters type 225 and 250. The mounting frame is attached by means of four countersunk screws (supplied with the frame). The counter can

easily be installed once the frame is in place. Slide the counter into the mounting frame and fasten to the baseplate from below.

ORDER INFORMATION

Flat connectors

Flat steel bar

Mounting frame for counters type 225 or 250, complete Ordering code 1 250 056

Flat connector 2.8 x 0.8 mm for electrical connection of all counters (except for counters with screw terminals)

Order information Ord. code 3 530 077

Flat steel bar for the installation of connection boxes of the modular system 400
12 x 3 x 105 mm
For description see installation instructions

Order information Ord. code 2 405 058