

P77 Series

Single Pressure Controls for Refrigeration, Air-conditioning and Heatpump Applications

Product Bulletin

Code No. LIT- 24.136 E
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These pressure controls are designed for use in a variety of applications involving refrigeration high or low pressure. Models supplied have a "whole range" design, enabling them to be used with refrigerants R22, R134A, R404A, R410A and all other non-corrosive refrigerants which are within the operating range of the control. They may also be used for other high or low pressure applications such as air, water etc. Models which can be used with ammonia are included in the program. Also models tested and approved to PED 97/23/EC Cat. IV (supersedes DIN and TUV approval) are included in the program.

The P77 series pressure controls may be used for control functions or limit functions, depending on model number. All models are provided with alarm contacts. All standard models have phosphor bronze bellows and brass pressure connections. Models for use with ammonia are provided with stainless steel bellows and connectors. Devices conforming to PED 97/23/EC Cat. IV (HP models) have the fail-safe function with double bellows.

Their IP54 classification means that these pressure controls are suitable for almost all applications.



**P77 Single Pressure Control
for Refrigeration**

Table 1: Features and Benefits

Features	Benefits
Generous wiring space	Easy wiring and maintenance
Splash-proof enclosure (IP54)	Can be used for indoor/outdoor applications
SPDT contacts are provided as standard on single pressure controls	Can be wired for alarm functions
Trip-free manual reset	Override is not possible in the control function



IMPORTANT: The controls are intended to control equipment under normal operating conditions. Where failure or malfunctioning of the controls could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory systems) intended to warn of or protect against failure or malfunctioning of the controls must be incorporated into and maintained as part of the control system.

Note: To facilitate order handling special ordering codes have been added to some commonly used models.

Table 2: Type number matrix

P77AAA	Automatic reset
P77BCA	Open low - manual reset
P77BEA	Open high - manual reset
P77AAW	HP or LP Limit (Auto. Reset) HP conforming to PED 97/23/CE
P77BEB	HP Limit (Man. Reset) conforming to PED 97/23/CE
P77BES	HP Safety Limit (Man. Reset) conforming to PED 97/23/CE
P77BCB	LP Limit (manual reset) including lockplate assy

Mounting

Mounting can easily be done with mounting bracket 271-51L (order separately) or directly on a surface. Mounting holes 4,5 mm Ø and M4 holes are provided.

Adjustment

Adjustment of range and differential can be done by turning the hexagonal range screw and differential screw. Manual reset models have a range screw only. The adjustment screw can also be locked by a lock plate accessory (KIT023N600). The lock plate is included with those devices which are conform to PED 97/23/EC Cat. IV.

On all models the scale indicates the high switch point (Except type P77BCA, P77BCB, here the scale indicates the low (cut-out) switch point). The low switch point can be derived by deducting the differential value from the high switch point.

Contact functions

(see also "Type Number Selection" tables)

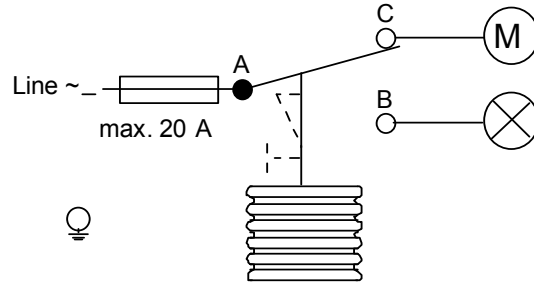


Fig. 1: A - C open on pressure decrease

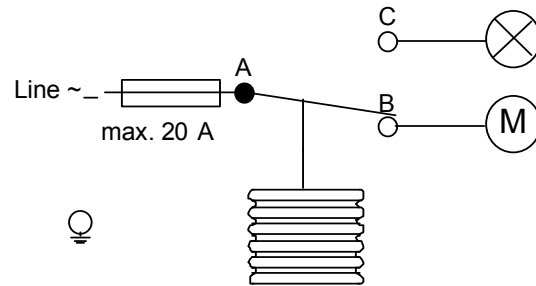


Fig. 2: A - B open on pressure increase

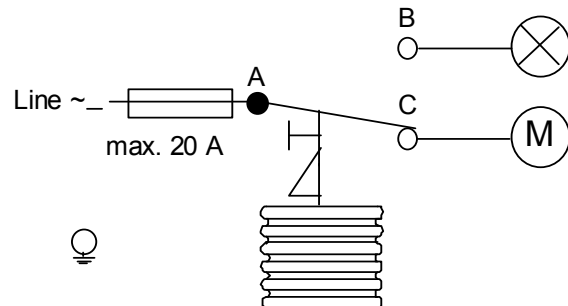


Fig. 3: A - C open on pressure increase

Optional construction note

If your requirements are not in the type number selection table, then please contact your Johnson Controls representative.

Repair and replacement

Repair is not possible. In case of an improperly functioning control, please check with your nearest supplier. When contacting the supplier for a replacement you should state the type/model number of the control. This number can be found on the data plate or cover label.

Type number selection table

Table 3: Pressure controls for Non-corrosive refrigerants

Family Code	Style 5			Style 30	Range (bar)	Diff. (bar)	Contact function (Figure)	Max Bellows Pressure
	Ind. Pack.	Code***	Bullpack	Ind. Pack.				
P77AAA	-9300	P77L	-9320	-9400	-0.5 to 7	0.5 to 3	1	22
	-9301	---	---	---	-0.2 to 10	1 to 4.5	1	15
	-9302	---	-9322	---	-0.3 to 2	0.4 to 1.5	1	4
	-9350	P77H	-9370	-9450	3 to 30	3 to 12	2	33
	-9351	P77A	-9371	-9451	3.5 to 21	2.1 to 5.5	2	30
P77BCA	-9300	---	-9320	-9400	-0.5 to 7	Man. res.**	1	22
P77BEA	-9350	P77HR	-9370	-9450	3 to 30	Man. res.*	3	33

*** Only individual package

** Resetable at 0.5 bar above cut-out point

* Resetable at 3 bar below cut-out point

Table 4: Pressure controls for Ammonia and Non-corrosive refrigerants

Family Code	Style 15		Range (bar)	Diff. (bar)	Contact function (Figure)	Max Bellows Pressure
	Ind. Pack.	Bullpack				
P77AAA	-9750	-9770	3 to 30	3.5 to 12	2	33
P77BCA	-9700	---	-0.5 to 7	Man. res.**	1	20
P77BEA	-9750	---	3 to 30	Man. res.*	3	33

** Resetable at 0.5 bar above cut-out point

* Resetable at 3 bar below cut-out point

Note: 100 kPa = 1 bar ≈ 14.5 psi

Table 5: Pressure controls for Non-corrosive refrigerants
(*Wächter, Begrenzer, Sicherheitsdruckbegrenzer including lockplate assy*)

Family Code	Style 5			Style 28	Range (bar)	Diff. (bar)	Contact function (Figure)	Max Bellows Pressure	Approved according to PED 97/23/EC Cat. IV
	Ind. Pack.	Code***	Bullpack	Ind. Pack.					
P77AAW	-9300	---	-9320	-9800	-0.5 to 7	0.5 to 3	1	20	---
	-9350	P77W	-9370	-9850	3 to 30	3.5 to 12	2	33	Yes
	-9355	---	---	-9855	3 to 42	4 to 12	2	48	Yes
P77BCB	-9300	---	-9320	-9800	-0.5 to 7	Man. res.**	1	20	---
P77BEB	-9350	P77B	-9370	-9850	3 to 30	Man. res.*	3	33	Yes
	-9355	---	---	-9855	3 to 42	Man. res.*	3	48	Yes
P77BES	-9350	P77S	-9370	-9850	3 to 30	Man. res.*	3	33	Yes

*** Only individual package

** Resetable at 0.5 bar above cut-out point

* Resetable at 3.5 bar below cut-out point

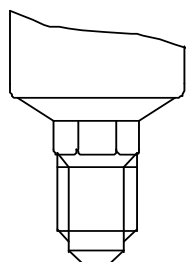
**Table 6: Pressure controls for Ammonia and Non-corrosive refrigerants,
(*Wächter, Begrenzer, Sicherheitsdruckbegrenzer including lockplate assy*)**

Family Code	Style 15		Range (bar)	Diff. (bar)	Contact function (Figure)	Max Bellows Pressure	Approved according to PED 97/23/EC Cat. IV
	Ind. Pack.	Bullpack					
P77AAW	-9700	---	-0.5 to 7	0.5 to 3	1	20	---
	-9750	---	3 to 30	3.5 to 12	2	33	Yes
P77BEB	-9750	---	3 to 30	Man. res.*	3	33	Yes
P77BES	-9750	---	3 to 30	Man. res.*	3	33	Yes

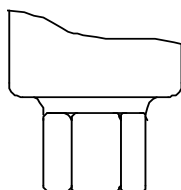
** Resetable at 0.5 bar above cut-out point

* Resetable at 3.5 bar below cut-out point

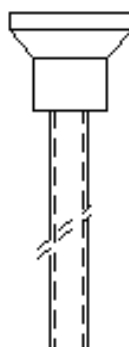
Pressure Connection



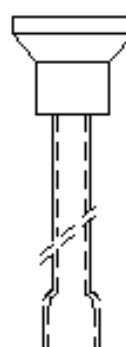
Style 5
Male connector
7/16" - 20 UNF for 1/4
6 mm flare nut.



Style 15
Female connector
1/4" - 18 NPT

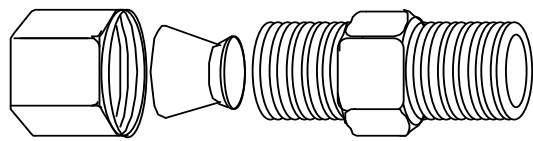


Style 28
Braze connection
6 mm ODM

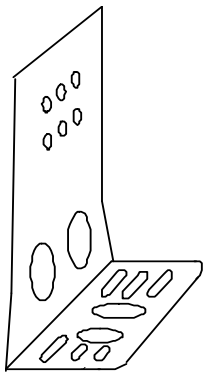


Style 30
Braze connection
1/4 ODF

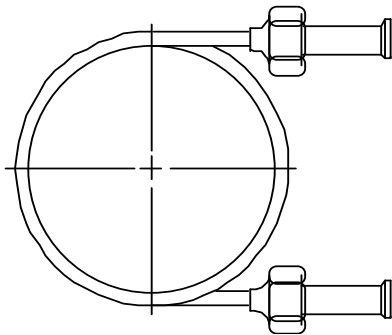
Accessories (optional)



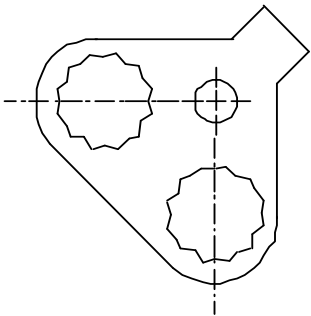
Description	Application	Order number
Fit into style 15 pressure connectors	For 6 mm copper or steel tubing	CNR003N001R
	For 8 mm copper or steel tubing	CNR003N002R



Mounting bracket
Order number
271-51L

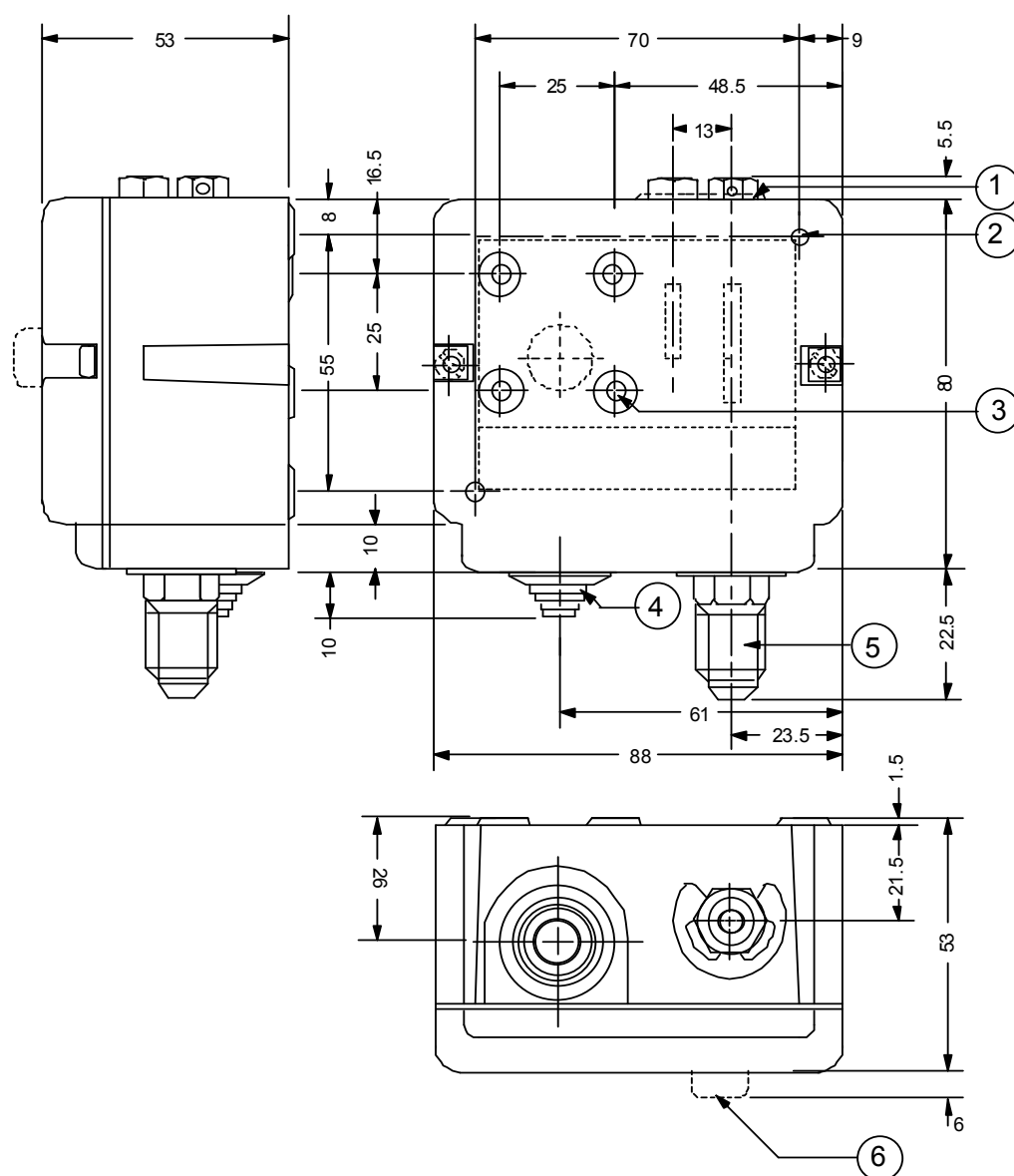


**90 cm Capillary
with (2) flare nuts (1/4" SAE)**
Order number
SEC002N600



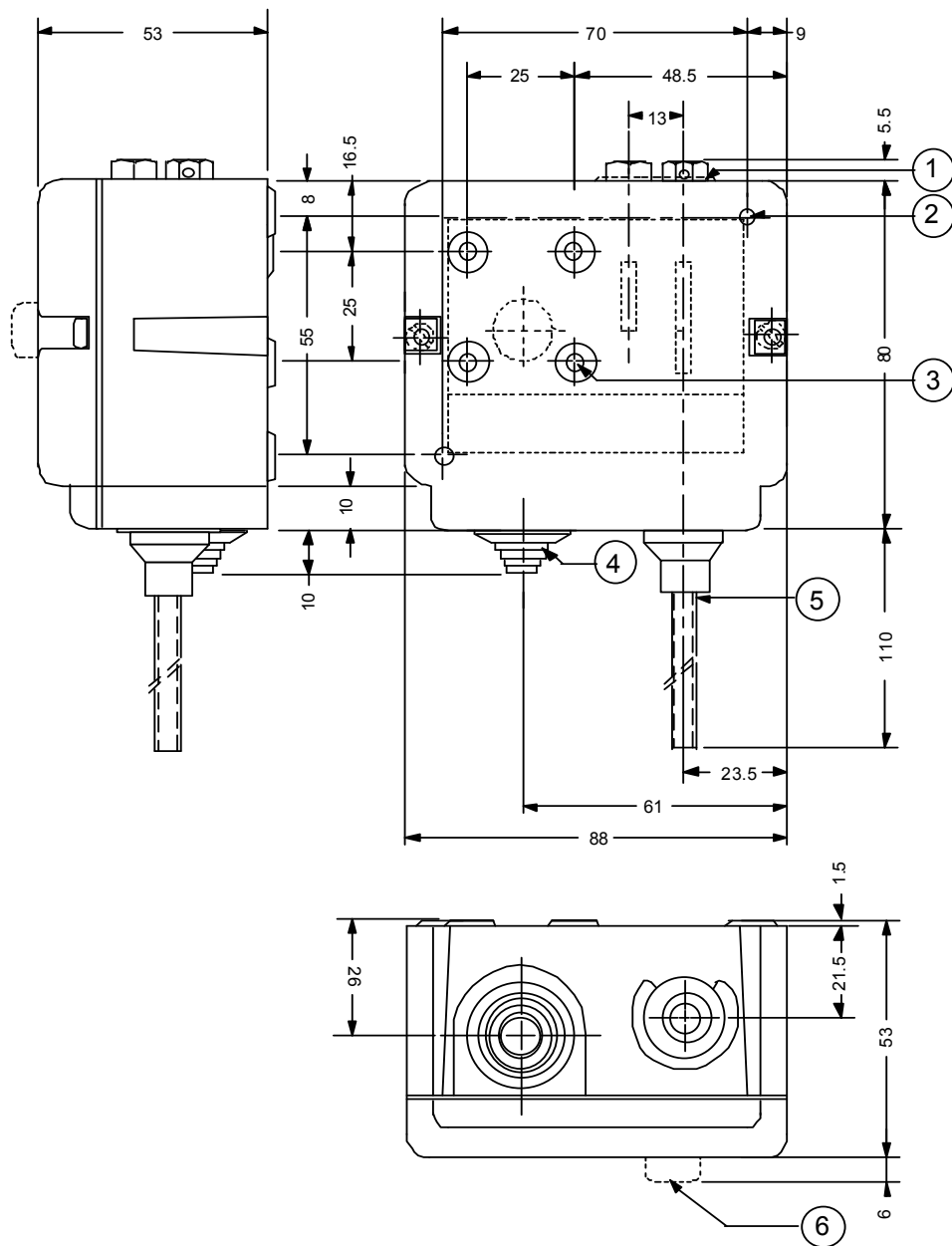
Locking kit
Order number
KIT023N600

Dimensions in mm (Style 5 and Style 15)



1. lock plate (if applied)
2. two mounting holes Ø 4.5 mm (knock out)
3. four mounting holes Ø M4 (back side)
4. cable inlet grommet (cable range Ø 5 to Ø 13 mm)
5. power element: Style 5: 7/16" -20 UNF male (shown)
Style 15: 1/4" -18 NPT female
6. reset button

Dimensions in mm (Style 28 and Style 30)



1. lock plate (if applied)
2. two mounting holes $\varnothing$ 4.5 mm (knock out)
3. four mounting holes $\varnothing$ M4 (back side)
4. cable inlet grommet (cable range $\varnothing$ 5 to $\varnothing$ 13 mm)
5. power element: Style 28: Braze connection 6 mm ODM (shown)
Style 30: Braze connection 1/4" ODF
6. reset button

Technical Specifications

Pressure connections	Style 5, 15, 28, 30 (see drawings)
Operating ranges and diff.	See type number selection
Adjustments	See type number selection
Ambient temp. limit	-50 to +55 °C (+70 °C max. duration two hours) -20 to +55 °C for PED approved models
Electrical ratings	400 Vac 16(10) A 220 Vdc 12 W (pilot duty only)
Pulsation plug	Fitted into all HP bellows on models with range 3.5 to 21 bar and up
Locking plate and screw	To lock and seal range and/or differential screw. Standard on types P77AAW, BEB, BES and BCB. Optional on all other types (quantity orders only)
Protection Class	IP54
Material	
Case and cover	Weatherproof aluminium (die-cast)
Contact unit	Large copper-backed silver cadmium contacts (AgCdO) on conductor leaves
Accessories (see pag. 5)	Mounting bracket Compression coupling 90 cm capillary with two flare nuts
Shipping weight	
	ind. pack 0.5 kg.
	-93xx { Ind. overpack 36 pcs. (19 kg)
	-97xx { Bulk pack 35 pcs. (18 kg)
	-94xx { Ind. overpack 16 pcs. (9 kg)
	-98xx {

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

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