

Series P77

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

Introduction

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 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 as well as controls tested, conforming to DIN 32733, and approved by TÜV are included in the program. DIN (HP) models are also tested and approved according to PED 97/23EC Cat. IV.



**P77 Single Pressure Control
for Refrigeration**

Description

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 DIN 32733 have a double bellows on the high pressure versions. Their IP54 classification means that these pressure controls are suitable for almost all applications.

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

Note

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

Type number matrix

P77AAA	Automatic reset
P77BCA	Open low - manual reset
P77BEA	Open high - manual reset
P77AAW	HP or LP Limit (Auto. Reset) conforming to DIN 32733
	HP conforming to PED 97/23CE
P77BEB	HP Limit (Man. Reset) conforming to DIN 32733, PED 97/23CE
P77BES	HP Safety Limit (Man. Reset) conforming to DIN 32733, PED 97/23CE
P77BCB	LP Limit (manual reset) conforming to DIN 32733

Mounting

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

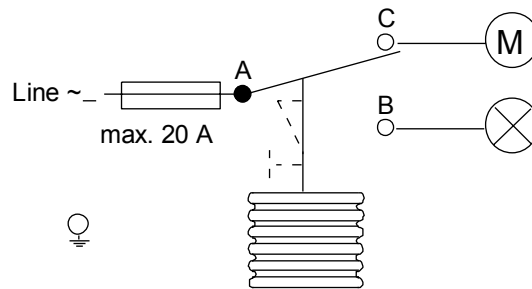
Adjustment

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 only included with those devices which are conform to DIN 32733.

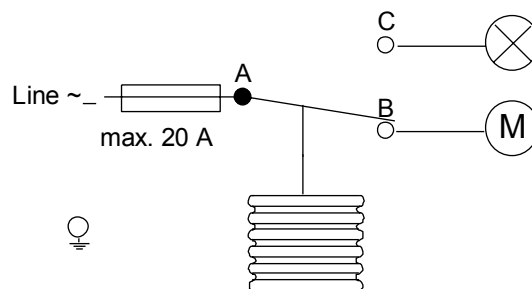
On all models the scale indicates the high switch point (Except type P77BCA, P77BCB, here the scale indicates the low (cut-out) switch point). The low switch point can be derived by deducting the differential value from the high switch point.

Contact functions

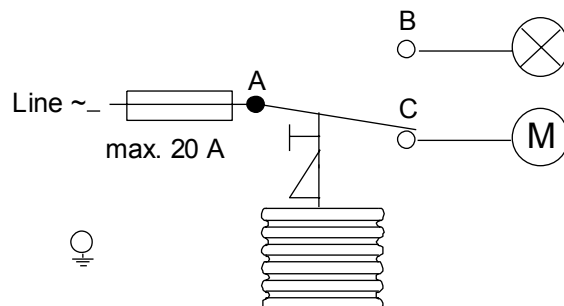
(see also "Type Number Selection" table)



A - C open on pressure decrease
Fig. 1



A - B open on pressure increase
Fig. 2



A - C open on pressure increase
Fig. 3

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

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***	Bulkpack	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

Pressure controls for Non-corrosive refrigerants, built in accordance with DIN 32733 and approved by TÜV Germany

Family Code	Style 5			Style 28	Range (bar)	Diff. (bar)	Contact function (Figure)	Max. Bellows pressure	Approved according to PED 97/23EC Cat. IV
	Ind. Pack.	Code***	Bulkpack	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
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
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

Pressure controls for Ammonia and Non-corrosive refrigerants, built in accordance with DIN 32733 and approved by TÜV Germany

Family Code	Style 15		Range (bar)	Diff. (bar)	Contact function (Figure)	Max. Bellows pressure	Approved according to PED 97/23EC Cat. IV
	Ind. Pack.	Bulkpack					
P77AAW	-9700		-0.5 to 7	0.5 to 3	1	20	
	-9750		3 to 30	3.5 to 12	2	33	Yes
P77BCB	-9700		-0.5 to 7	Man. res.**	1	20	
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 controls for Ammonia and Non-corrosive refrigerants

Family Code	Style 15		Range (bar)	Diff. (bar)	Contact function (Figure)	Max. Bellows pressure
	Ind. Pack.	Bulkpack				
P77AAA	-9700		-0.5 to 7	0.5 to 3	1	20
	-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

Pressure connections

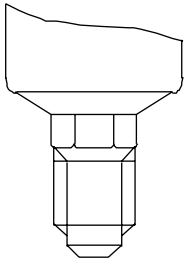


Fig. 4
Style 5
Male connector
7/16\"-20 UNF for 1/4\"
6 mm flare nut.

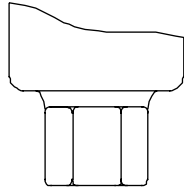


Fig. 5
Style 15
Female connector
1/4\"-18 NPT

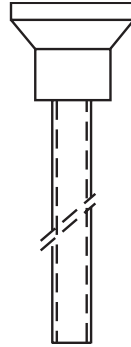


Fig. 6
Style 28
Braze connection
6 mm ODM

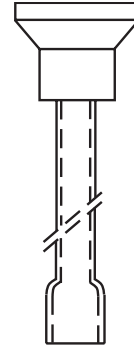


Fig. 7
Style 30
Braze connection
1/4\" ODF

Accessories (optional)

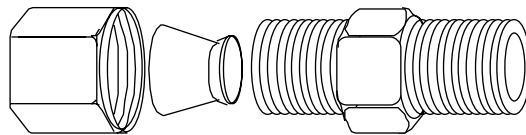


Fig. 8

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

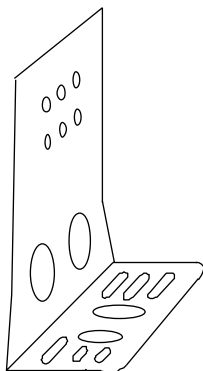


Fig. 9
Mounting bracket
Order number **271-51L**

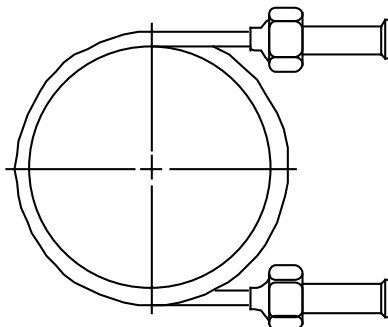


Fig. 10
90 cm Capillary with (2) flare nuts (1/4\" SAE)
Order number **SEC002N600**

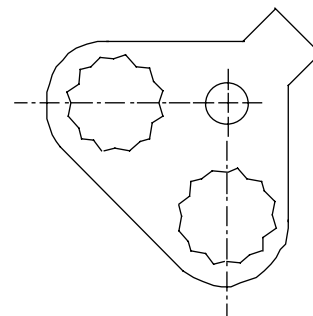
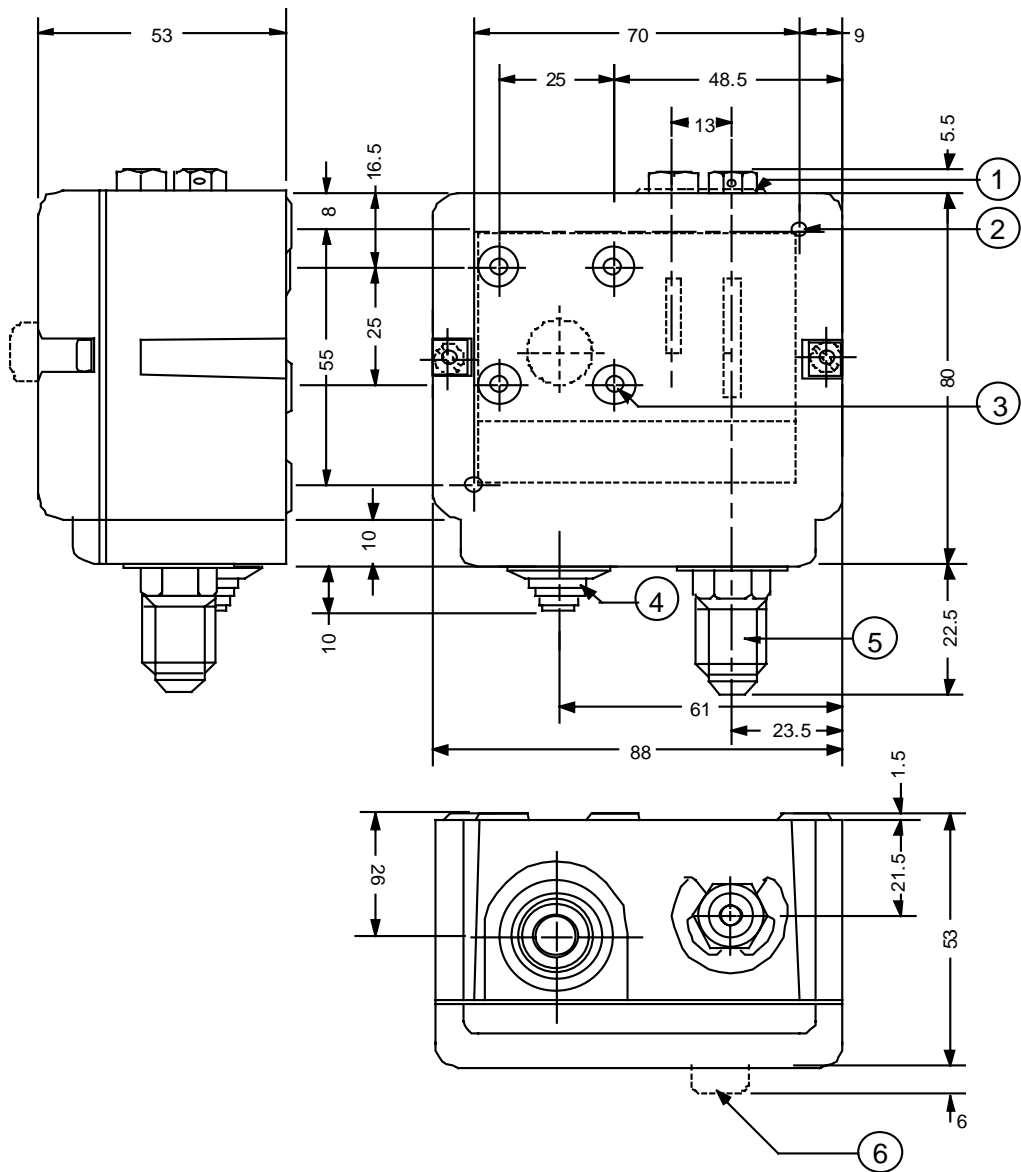


Fig. 11
Locking kit
Order number **KIT023N600**

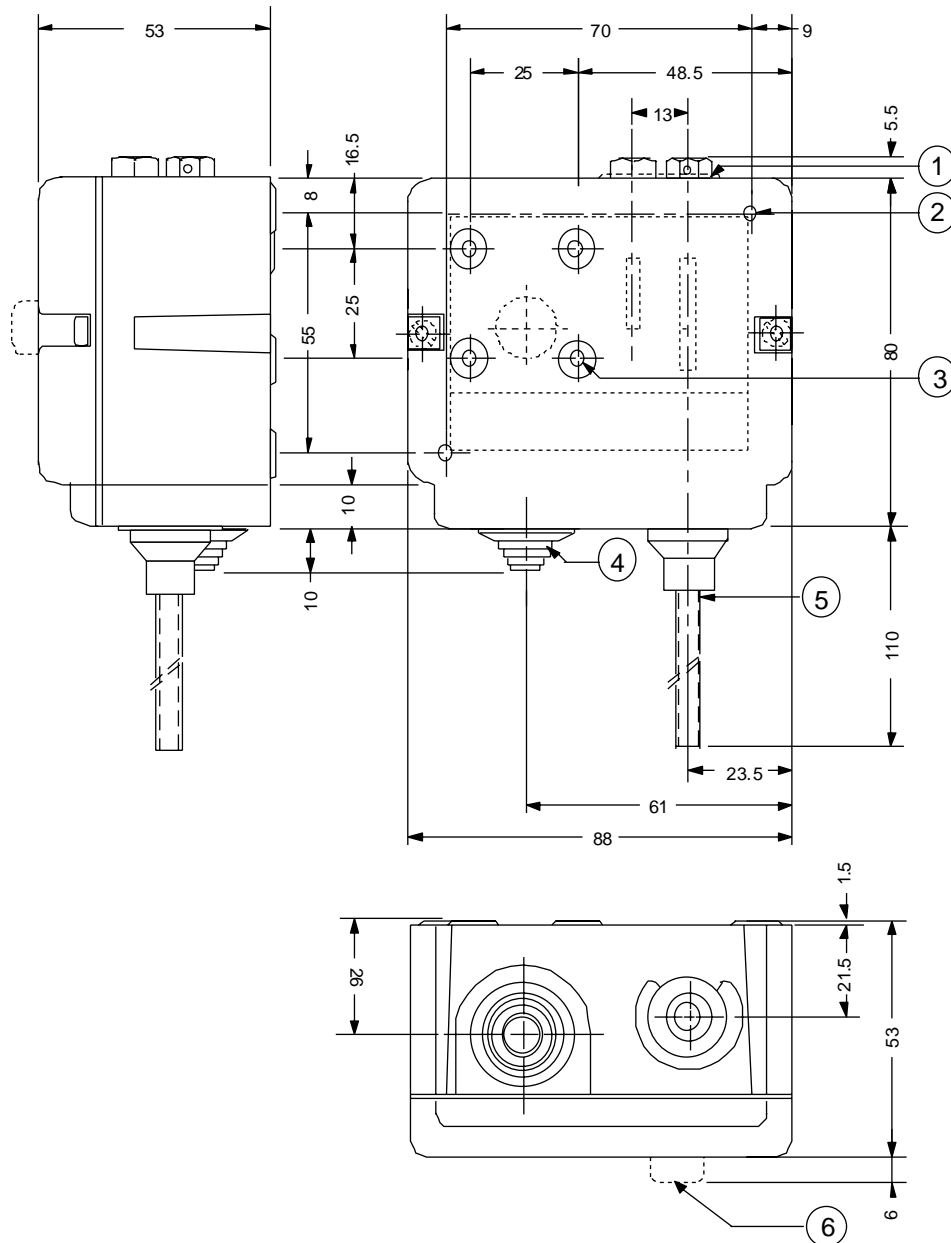
Dimensions (mm)



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

Fig. 12

Dimensions (mm)



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

Fig. 13

Notes

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 DIN and 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. 4)	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 applications at conditions beyond these specifications, consult the local Johnson Controls office or representative. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.



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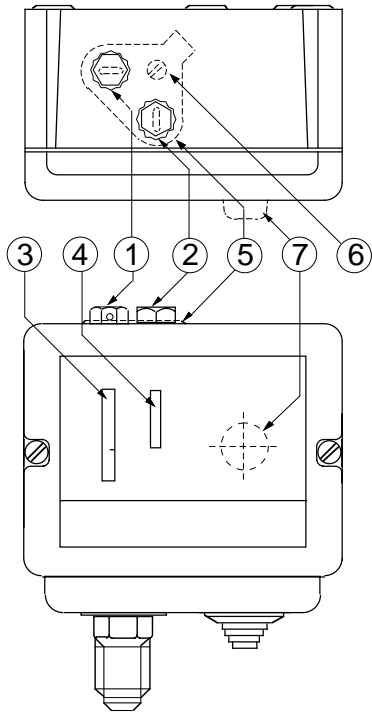
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Instruction sheet

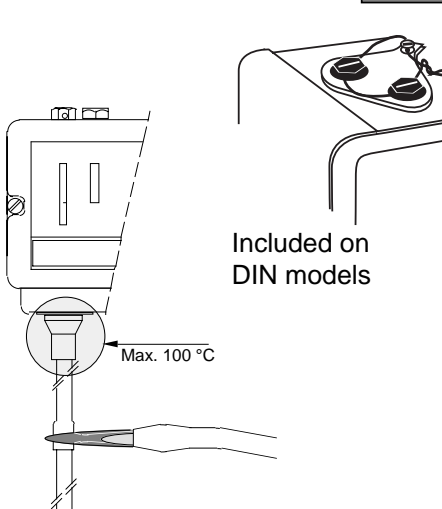
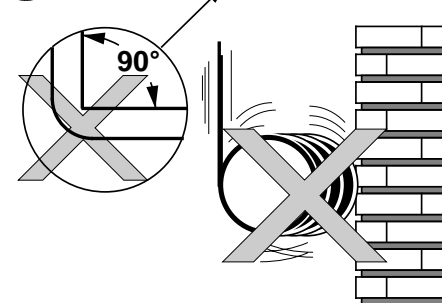
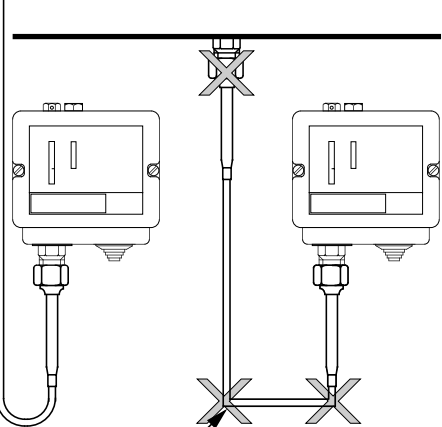
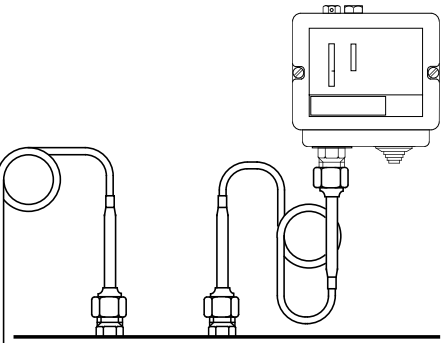
P77 Single Pressure Control

Specification Specificatie Especificação Beskrivelse Technická data	Description Especificación Specificationer Spesifikasjoner	Spesifikation Specifiche Erittely Προδιαγραφές
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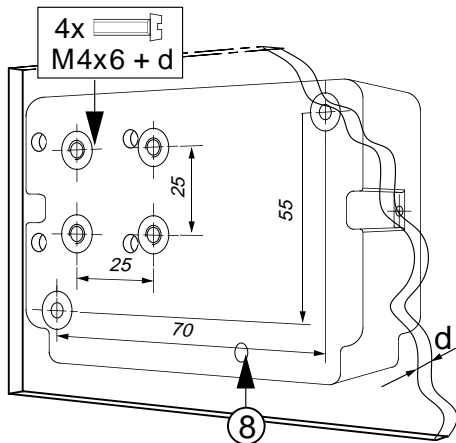
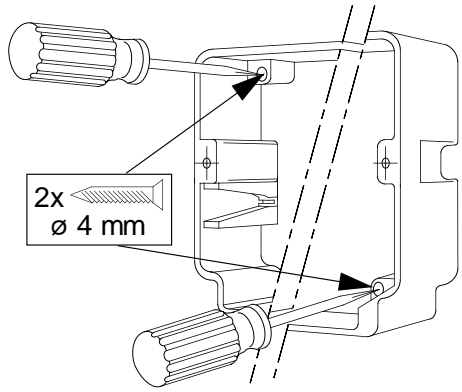


T min.:	-50 °C
PED:	-20 °C
T max.:	+55 °C

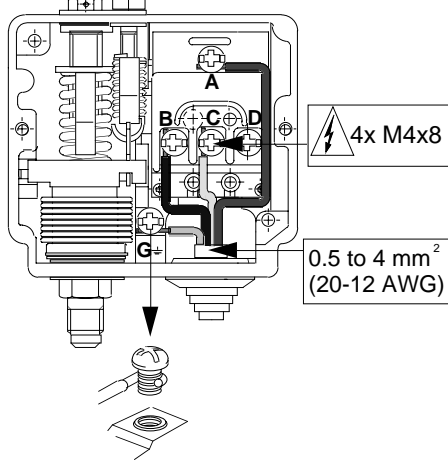
Mounting Montage Montagem Montering Instalace	Montage Montaje Montering Montering	Montage Montaggio Kiinnitys Μοντάρισμα
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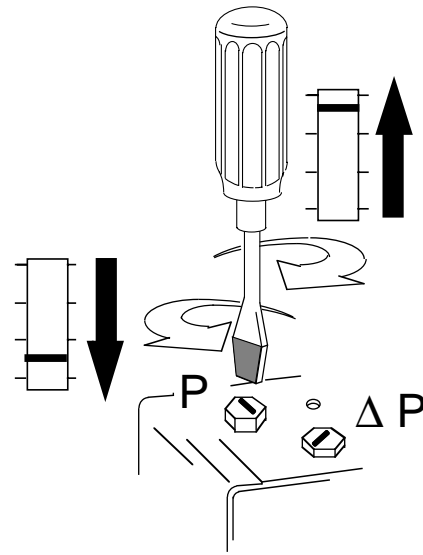
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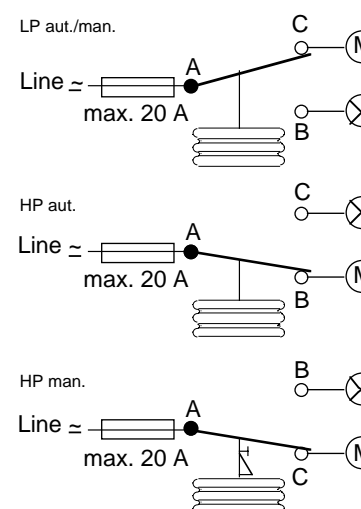
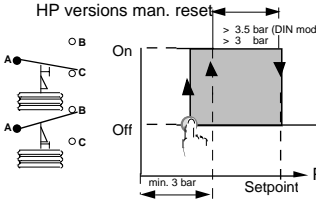
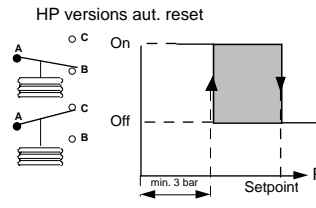
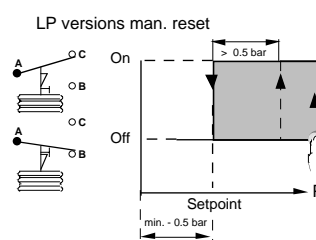
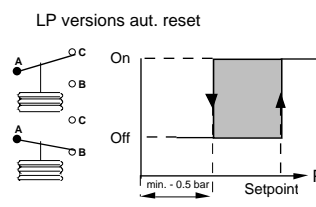
Wiring Bedrading Kabling Καλωδιωση Zapojeni	Raccordement Cablado Cablagem	Verdrahtung Cablaggio Ledningar Elektrisk installation
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Adjustment Instelling Ajuste Ρύθμιση Seřízení	Réglage Ajuste Justering Justering	Einstellung Regolazione Säätö Justering
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Adjustment Instelling Ajuste Ρύθμιση Seřízení	Réglage Ajuste Justering Justering	Einstellung Regolazione Säätö Justering
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Specification Specificatie Especificação Beskrivelse Technická data	Description Especificación Specificationer Spesifikasjoner	Spesifikation Specifiche Erittely Προδιαγραφές
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Electrical rating: 16(10) A, 400V ~ 230V ~, 12W (pilot duty only)
 Enclosure: IP54 according to DIN 40050 and IEC 144
 Amb. temp. limits: -50 to +55 °C for standard models
 -20 to +55 °C for DIN approved models
 Storage temp.: -50 to +55 °C
 Max. bellows press.: Range -0.3 to 2 bar: 4 bar
 -0.5 to 7 bar: 22 bar
 (ammonia models only) -0.5 to 7 bar: 14 bar
 1 to 10 bar: 15 bar
 0.35 to 21 bar: 30 bar
 3 to 30 bar: 33 bar

note: 1 bar = 100 kPa = 14.5 psi

ENGLISH

- READ THIS INSTRUCTION SHEET CAREFULLY BEFORE INSTALLING, RETAIN IT SAFELY FOR FUTURE REFERENCE.**
- 1 Setpoint adjustment screw (P)
 - 2 Differential adjustment screw (not on manual reset models) (ΔP)
 - 3 Setpoint indicator
 - 4 Differential indicator (not on manual reset models)
 - 5 Lock plate (if applied)
 - 6 Lock plate screw (if applied)
 - 7 Reset button (manual reset models only)
 - 8 Drainhole

The P77 is a pressure control designed to sense pressure of non-corrosive refrigerants. The P77xxx-97xx series are also suitable for use in ammonia applications.

According to EN 60730 it is a type 1 action, incorporate control, suitable for surface mounting on a plane surface and for use in normal pollution situation.

These controls are designed for use only as operating controls. Where an operating control failure would result in personal injury or loss of property it is the responsibility of the installer to add devices or systems that protect against, or warn of, control failure.

INSTALLATION

Note
 This device is provided with a drainhole on the backside for constant draining of condensate. Under normal mounting conditions i.e. in upright position against a wall, this provision is sufficient for a normal performance under IP54 conditions. For a different way of mounting be sure that provisions will be made to maintain the IP54 class conditions and permanent drain function.

△ Disconnect from power supply before the cover is removed.

Wiring
 All wiring should conform to local codes and must be carried out by authorized personnel only. When using multi-stranded wire apply a cable ferrule to the cable end.

Check out procedure
 Before leaving the installation observe at least three complete operating cycles to be sure that all components are functioning correctly. If not contact your supplier.

FRANÇAIS

LISEZ ATTENTIVEMENT CES INSTRUCTIONS AVANT DE COMMENCER L'INSTALLATION ET CONSERVEZ-LES POUR VOUS Y REFERER ULTERIEUREMENT

1. Vis de réglage de la consigne (P)
2. Vis de réglage du différentiel (pas sur les modèles de réenclenchement manuel)(ΔP)
3. Indicateur de consigne
4. Indicateur du différentiel (pas sur les modèles de réenclenchement manuel)
5. Case de serrure (si elle existe)
6. Vis de la case de serrure (si elle existe)
7. Bouton de réenclenchement (pour les modèles à réenclenchement manuel uniquement)
8. Perçage de drainage

Le modèle P77 est un régulateur de pression destiné à détecter la pression de réfrigérants non corrosifs. Les séries P77xxx-97xx conviennent également dans l'emploi d'applications d'ammoniac.

D'après la norme EN 60730 c'est un régulateur incorporé, action type 1, conçu pour un montage sur surface plane et utilisé dans des environnements normalement pollués.

Cet appareil est destiné à assurer des fonctions de régulation. Lorsque la panne ou le mauvais fonctionnement de ce dernier risque d'entraîner des dommages matériels ou corporels, il est de la responsabilité de l'installateur de prévoir des organes de sécurité indépendants afin de ne pas utiliser le régulateur en équipement de sécurité.

INSTALLATION

Remarque
 Cet appareil est fourni avec un perçage de drainage situé à l'arrière afin de drainer les condensats de façon constante. Dans des conditions normales de montage, c'est-à-dire lorsqu'il est fixé bien droit contre le mur. Cette mesure est suffisante en cas d'utilisation normale répondant aux conditions IP54. Si le montage est différent, veillez à ce que les mesures respectent les conditions de la classe IP54 et assurent la fonction de drainage en permanence.

△ Couper l'alimentation électrique avant d'enlever le couvercle.

Câblage
 Tous les raccordements doivent être conformes aux normes en vigueur et ne peuvent être réalisés que par du personnel autorisé. En cas d'utilisation de câble souple multi-brins, utiliser un embout à sertir.

Procédure de contrôle
 Après avoir terminé l'installation, observez au moins trois cycles complets de fonctionnement pour s'assurer que tous les composants fonctionnent correctement. Si cela n'est pas le cas, contactez votre fournisseur.

DEUTSCH

BITTE LESEN SIE DIESE ANWEISUNGEN VOR DER INSTALLATION SORGFÄLTIG DURCH UND BEWAHREN SIE SIE ZUR WEITEREN VERWENDUNG AUF.

- 1 Sollwertinstellschraube (P)
- 2 Differentialeinstellschraube (Nicht bei Modellen mit manueller Rückstellung)(ΔP)
- 3 Sollwertanzeige
- 4 Differentialanzeige (Nicht bei Modellen mit manueller Rückstellung)
- 5 Sicherungsscheibe (falls zutreffend)
- 6 Sicherungsschraube (falls zutreffend)
- 7 Rückstellaste (Nur Modelle mit manueller Rückstellung)
- 8 Drainage-Öffnung

Der P77 ist ein Druckregler zum Fühlen des Drucks nichtagressiver Kühlmittel. Die Baureihe P77xxx-97xx ist auch für den Einsatz in Verbindung mit Ammoniak geeignet.

Dieses ist entsprechend EN 60730 ein Wirkungsweise Typ 1, Integriertes Regel- und Steuergerät, Geeignet als Aufbaugerät, z. B. für Wandmontage und für Anwendung in Umgebungsbedingungen mit üblicher Verunreinigung.

Diese Regler sind ausschließlich zur Verwendung als Bedienelemente vorgesehen. In Situationen, in denen das Versagen eines Bedienelementes Personenschäden oder Sachverluste nach sich ziehen kann, ist der Installateur dafür verantwortlich, entsprechende Vorrichtungen oder Systeme einzubauen, die einem Regelversagen entgegenwirken oder die als entsprechende Frühwarnsysteme dienen.

Montage Hinweise

An der Rückseite dieses Gerät befindet sich eine Drainage-Öffnung, über die Kondenswasser permanent abgeführt wird. Unter normalen Montagebedingungen, d.h. in aufrechter Position an einer Wand, gewährleistet diese Vorkehrung eine normale Leistung gemäß den Anforderungen von Schutzart IP54. Bei einer anderen Montageposition ist durch entsprechende Vorkehrungen sicherzustellen, daß die Anforderungen von Schutzart IP54 erfüllt werden und eine permanente Drainage gewährleistet ist.

△ Vor dem Entfernen des Deckels Spannung abschalten.

Verdrahtung
 Alle Verdrahtungen müssen den am Einsatzort geltenden Vorschriften entsprechen und sind ausschließlich dazu befugten Personen vorbehalten. Bei Verwendung feindrätiger Leitungen sind Adernhülsen zu verwenden.

Überprüfung
 Vor dem Verlassen der Anlage sollten Sie diese mindestens drei Betriebszyklen beobachten und überprüfen, daß alle Komponenten ordnungsgemäß funktionieren. Sollte dies nicht der Fall, wenden Sie sich bitte an Ihren Händler.

NEDERLANDS

NEEM DEZE INSTRUCTIES GRONDIG DOOR ALVORENS U BEGINT MET HET INSTALLEREN EN BEWAAR ZE VOOR TOEKOMSTIG GEBRUIK

- 1 Setpoint instelschroef (P)
- 2 Differentie instelschroef (niet op man. reset modellen) (TP)
- 3 Setpoint aanwijsschaal
- 4 Differentie aanwijsschaal (niet op man. reset modellen)
- 5 Borgplaat (indien meegeleverd)
- 6 Borgplaat schroef (indien meegeleverd)
- 7 Reset drukknop (allen op man. reset modellen)
- 8 Condens afvoeropening

De P77 is een pressostaat ontworpen voor het meten van drukken van niet corrosieve koelmiddelen. De P77xxx-97xx series zijn ook te gebruiken voor ammoniak toepassingen.

Volgens EN 60730 is het een type 1 aktie in te bouwen apparaat, geschikt voor montage op een plat oppervlak en geschikt voor gebruik in een normaal vervuilde omgeving.

Deze apparaten zijn alleen ontworpen voor gebruik als regelaar. Als een foutieve werking van de regelaar persoonlijk letsel of schade kan veroorzaken, moet de installateur beveiliging of alarm apparatuur aansluiten die aangeeft dat de regelaar niet functioneert.

Montage

Opmerking
 Dit apparaat is voorzien van een condens afvoeropening, voor permanente afvoer van condens. Onder normale omstandigheden, d.w.z. in verticale positie tegen een wand gemonteerd, is deze voorziening voldoende om onder IP54 condities te kunnen functioneren. Bij een ander montage wijze dient erop te worden gelet dat voorzieningen worden getroffen zodat de permanente afvoer van condens alsmede de IP54 bescherming gehandhaafd blijft.

△ Schakel de voedingsspanning af voordat het deksel wordt verwijderd.

Bedrading
 De installatie, de elektrische aansluiting en de instellingen dienen overeen te stemmen met de plaatselijke voorschriften en mogen enkel worden uitgevoerd door bevoegd personeel. Indien een draad met flexibele kern wordt toegepast dient het uiteinde van de draden te worden voorzien van een ader eindhuls.

Controleprocedure
 Controleer, voordat u de installatie zelfstandig laat werken, gedurende ten minste drie complete werkcycli of alle onderdelen correct werken. Werk de installatie niet correct, neem dan contact op met uw leverancier.

