

PRODUCT BULLETIN

Series P78
**Dual Pressure Controls for Refrigeration,
 Air-conditioning and Heatpump Applications**

Introduction

These dual 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 models are also tested and approved according to PED 97/23CE Cat. IV



P78 Dual Pressure Control for Refrigeration

Description

The P78 series pressure controls may be used for control functions or limit functions, depending on model number. All models are provided with alarm contacts (except P78ALA). 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"/> Trip-free manual reset	Override is not possible in the control function
<input type="checkbox"/> Patented separate alarm contacts for both low pressure and high pressure cut-out (except P78ALA)	Easy monitoring of the fault location

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

P78LCA	Automatic reset both sides
P78MCA	Automatic reset low side manual reset high side
P78PGA	Manual reset both sides
P78LCW	Automatic reset both sides conform DIN32733, PED 97/23CE
P78MCB	Automatic reset low side manual reset high side conform DIN32733, PED 97/23CE
P78MCS	Automatic reset low side manual reset high side conform DIN32733, PED 97/23CE
P78PGB	Manual reset both sides conform PED 97/23CE
P78PLM	2 x manual rest HP conform DIN32733, PED 97/23CE
P78ALA	Dual fan cycling control (2 x SPST close high)

Adjustment

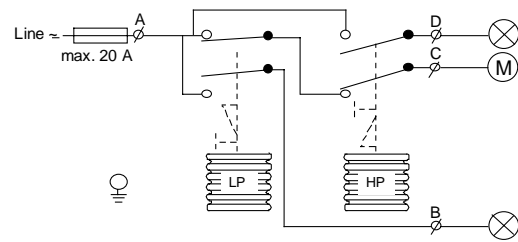
On most models the range scale indicates the high switch point (exception: LP side of P78PGA, P78PGB, here the range scale indicates the low switching point). To obtain low switch point deduct differential value from the high switch point.

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.

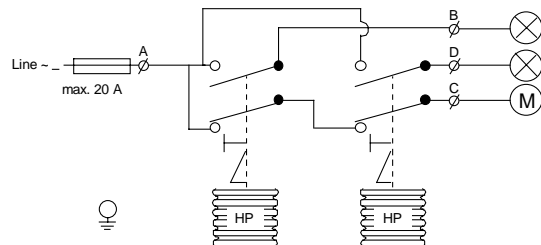
Contact functions

(see also "Type Number Selection" table)



- LP.** A - C opens on pressure decrease
A - B closes simultaneously
- HP.** A - C opens on pressure increase
A - D closes simultaneously

Fig. 1



- Left side HP.** A - C opens on pressure increase
A - B closes simultaneously
- Right side HP.** A - C opens on pressure increase
A - D closes simultaneously

Fig. 2

Switching action P78ALA

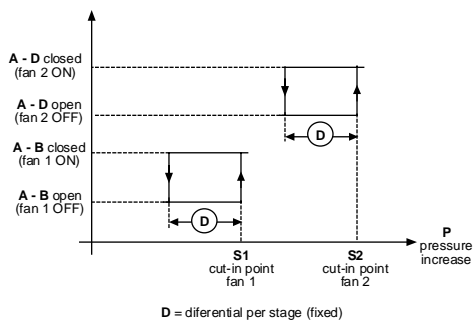


Fig.3a

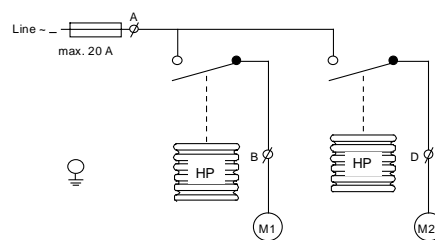


Fig. 3b

Type number selection table

Dual pressure controls for Non-corrosive refrigerants. LP Pmax.: 22bar HP Pmax.:33 bar

Family Code	Pressure Connection				Left Side		Right Side		Contact function (Figure)	Construction
	Style 5			Style 30	Range (bar)	Diff. (bar)	Range (bar)	Diff. (bar)		
	Incl. Pack.	Code***	Bulk-pack	Incl. Pack.						
P78LCA	-9300	P78L	-9320	-9400	-0.5 to 7	0.5 to 3	3 to 30	3 (fixed)	1	LP/HP
P78MCA	-9300	P78M	-9320	-9400	-0.5 to 7	0.5 to 3	3 to 30	Man. res.**	1	

*** Wholesaler code only for individual pack
 ** Resetable at 3 bar below cut-out point
 * Resetable at 0.5 bar above cut-out point

Dual pressure controls for Non-corrosive refrigerants, built in accordance with DIN 32733 and approved by TÜV Germany (Except P78PGB-*). LP Pmax.: 20 bar HP Pmax.:33 bar

Family Code	Pressure Connection				Left Side		Right Side		Contact function (Figure)	Approved according to PED 97/23CE Cat. IV
	Style 5			Style 28	Range (bar)	Diff. (bar)	Range (bar)	Diff. (bar)		
	Incl. Pack.	Code***	Bulk-pack	Incl. Pack.						
P78LCW	-9300	P78W	-9320	-9800	-0.5 to 7	0.5 to 3	3 to 30	3 (fixed)	1	Yes
P78MCB	-9300	P78B	-9320	-9800	-0.5 to 7	0.5 to 3	3 to 30	Man. res.**	1	Yes
P78MCS	-9300	P78S	-9320	-9800	-0.5 to 7	0.5 to 3	3 to 30	Man. res.**	1	Yes
P78PGB	-9300	P78P	****	-9800	-0.5 to 7	Man. res.*	3 to 30	Man. res.**	1	Yes
P78PLM	-9350	P78BS	****	-9850	3 to 30	Man. res.**	3 to 30	Man. res.**	2	Yes

**** Can be set up for quantity orders
 *** Wholesaler code only for individual pack
 ** Resetable at 3.5 bar below cut-out point
 * Resetable at 0.5 bar above cut-out point

Dual pressure controls for Ammonia and Non-corrosive refrigerants, LP Pmax.: 20 bar HP Pmax.:33 bar

Family Code	Pressure Connection				Left Side		Right Side		Contact function (Figure)	Construction
	Style 15			Style 30	Range (bar)	Diff. (bar)	Range (bar)	Diff. (bar)		
	Incl. Pack.	Code***	Bulk-pack							
P78LCA	-9700		****		-0.5 to 7	0.5 to 3	3 to 30	3 (fixed)	1	LP/HP
P78MCA	-9700		****		-0.5 to 7	0.5 to 3	3 to 30	Man. res.**	1	
P78PGA	-9700		****		-0.5 to 7	Man. res.**	3 to 30	Man. res.**	1	

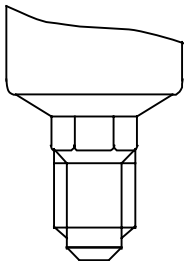
**** Can be set-up for quantity orders
 *** Wholesaler code only for individual package
 ** Resetable at 3 bar below cut-out point
 * Resetable at 0.5 bar above cut-out point

Dual pressure Fan cycling controls for Air-cooled condensers (Non-corrosive refrigerants) HP Pmax.: 30 bar

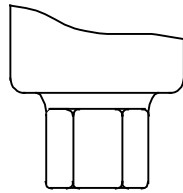
Family Code	Pressure Connection				Left Side		Right Side		Contact function (Figure)	Construction
	Style 5			Style 30	Range (bar)	Diff. (bar)	Range (bar)	Diff. (bar)		
	Incl. Pack.	Code***	Bulk-pack	Incl. Pack.						
P78ALA	-9351	P78A	****	-9451	3.5 to 21	1.8 (fixed)	3.5 to 21	1.8 (fixed)	3	HP/HP

**** Can be set-up for quantity orders
 *** Wholesaler code only for individual package
 Note: 100 kPa = 1 bar ≈ 14.5 psi

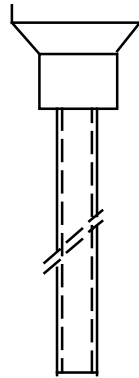
Pressure connections



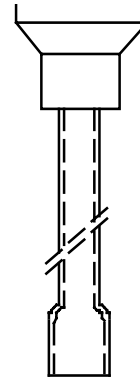
**Fig. 4
Style 5**
Male connector
7/16"-20 UNF for 1/4"
6 mm flare nut.



**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)

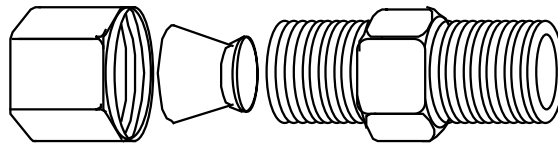


Fig. 8

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

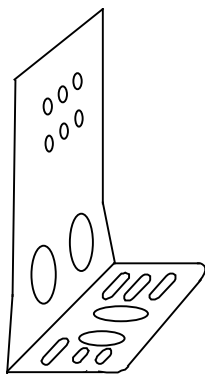


Fig. 9
Mounting bracket
Order number **271-51L**

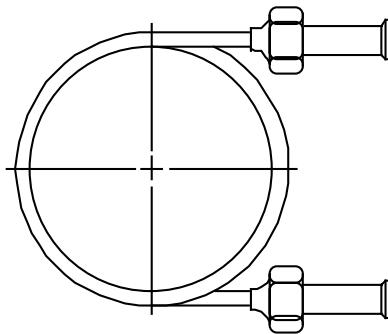


Fig. 10
90 cm Capillary with (2) flare
nuts (1/4" SAE)
Order number **SEC002N600**

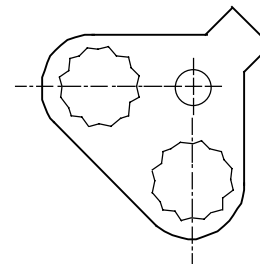
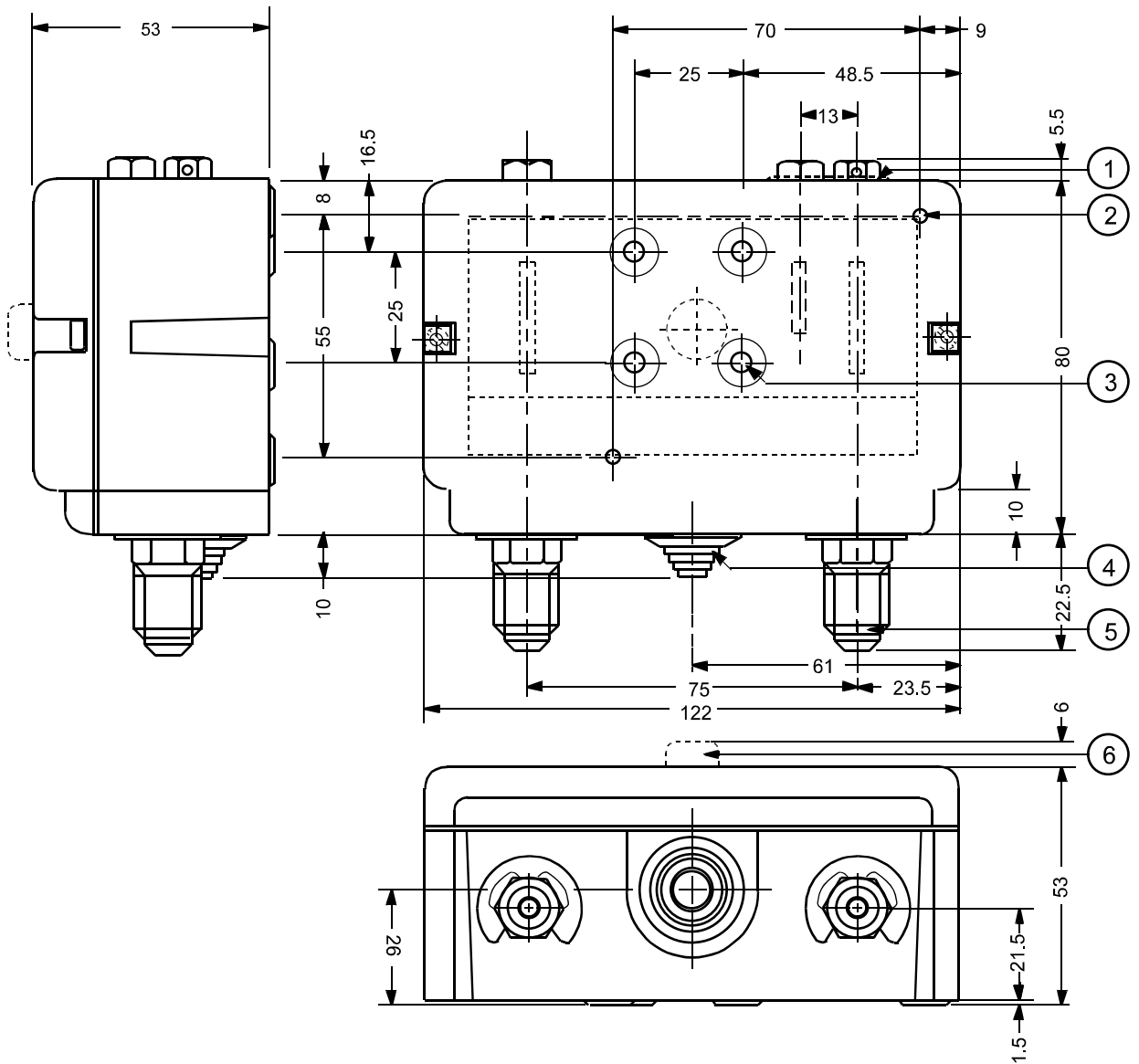


Fig. 11
Locking kit
Order number **KIT023N600**

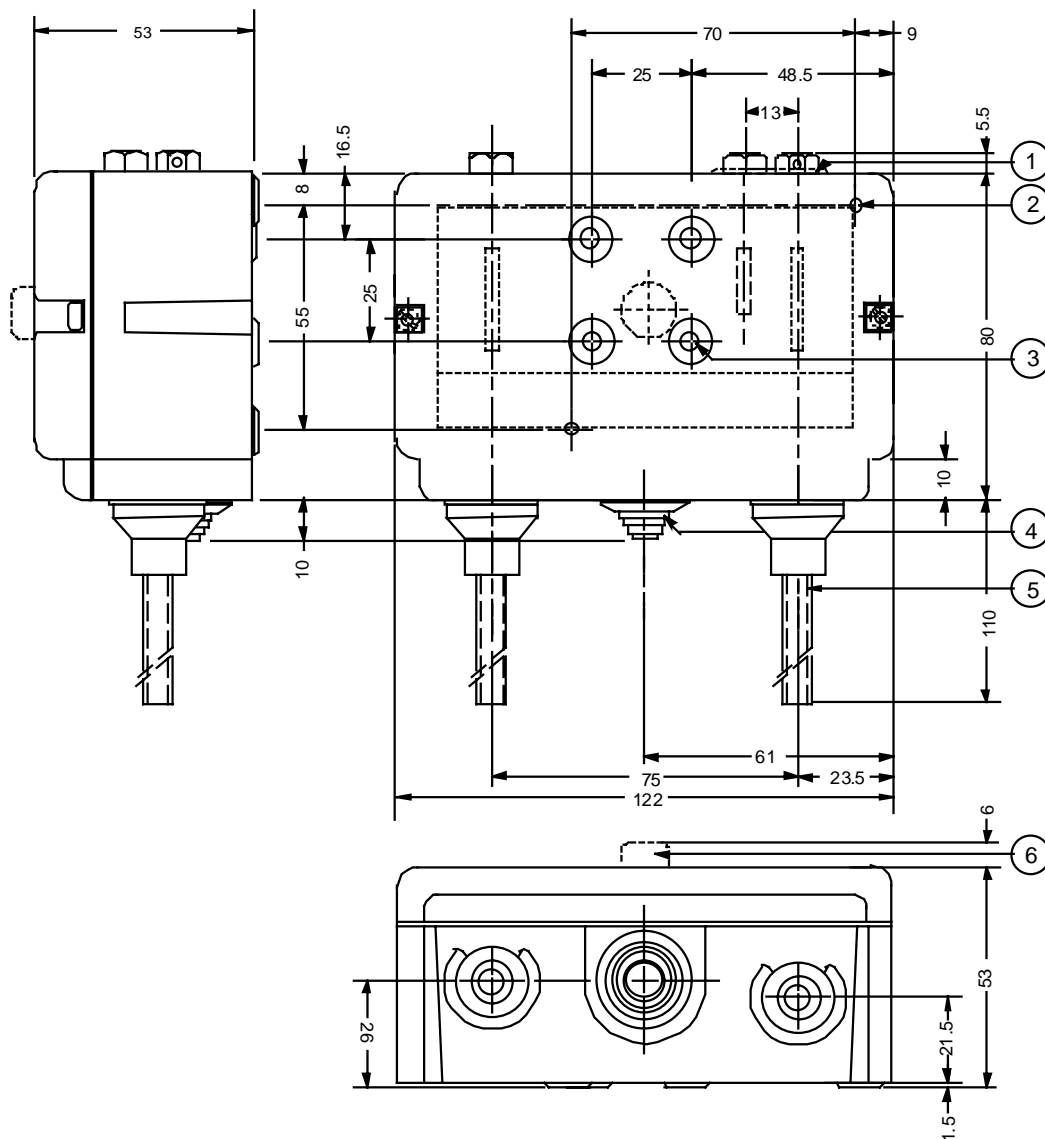
Dimensions (mm)



1. lock plate (if applied)
2. two mounting holes 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

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	contact A-C	16(10) A
		contact A-B	8(5) A
		contact A-D	8(5) A
	220 Vdc 12 W (pilot duty only)		
Pulsation plug	Fitted into all HP bellows		
Locking plate and screw	To lock and seal range and/or differential screw. Standard on types P78LCW, MCB, MCS, PGB and PLM. 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	0.8 kg	
	-93xx	}	Ind. overpack 30 pcs. (24.5 kg)
	-97xx		Bulk pack 24 pcs. (19.5 kg)
	-94xx	}	Ind. overpack 13 pcs. (11 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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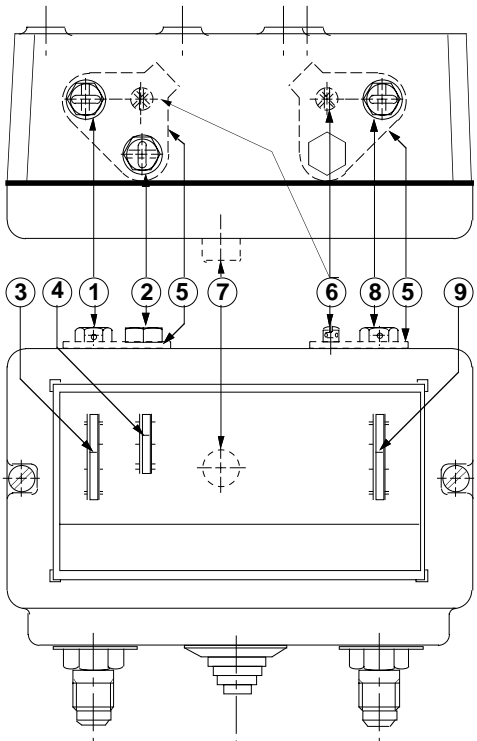
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Instruction sheet

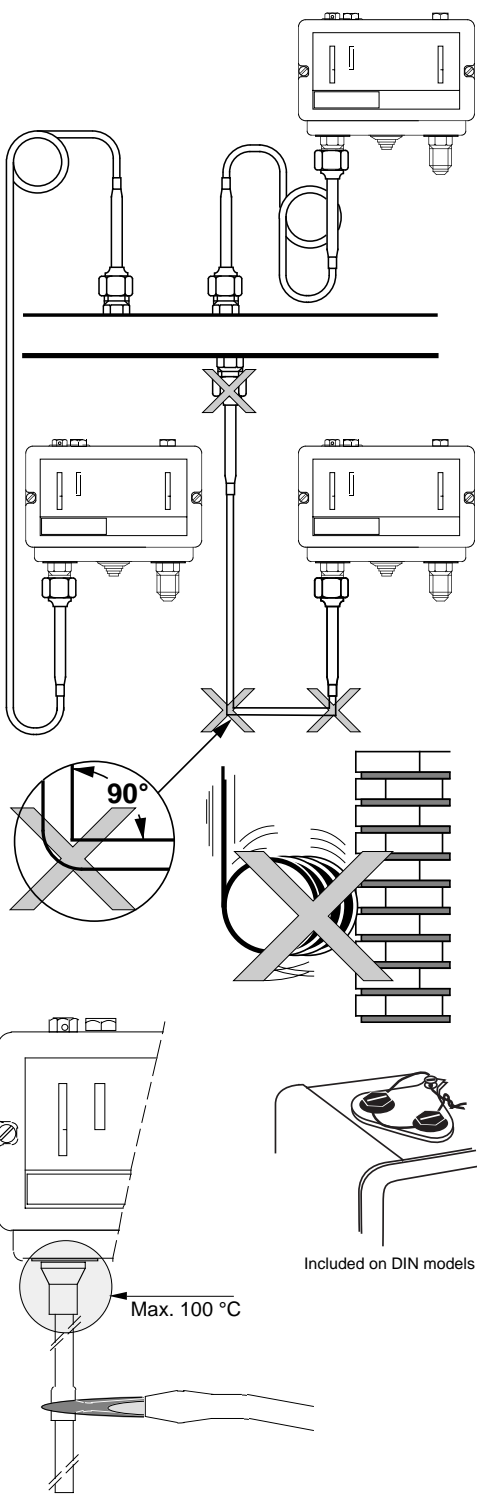
P78 Dual Pressure Control

Specification Specificatie Especificação Beskrivelse Technická data	Description Descripción Descrição Beskrivelse Technická data	Spesifikation Specifiche Erittely Προδιαγραφές
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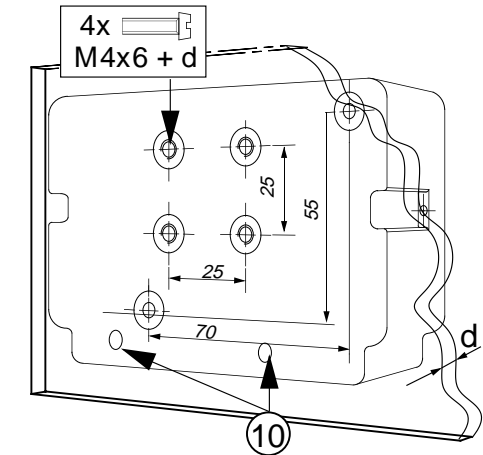
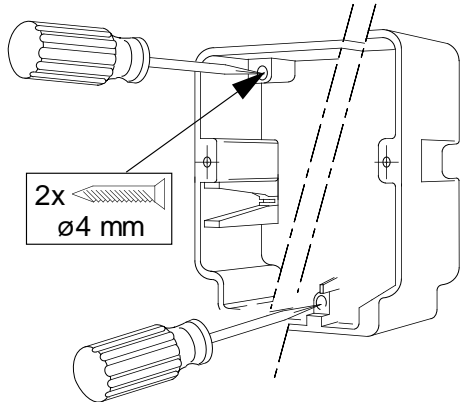


T min.:	-50 °C
DIN models	-20 °C
T max.:	+55 °C

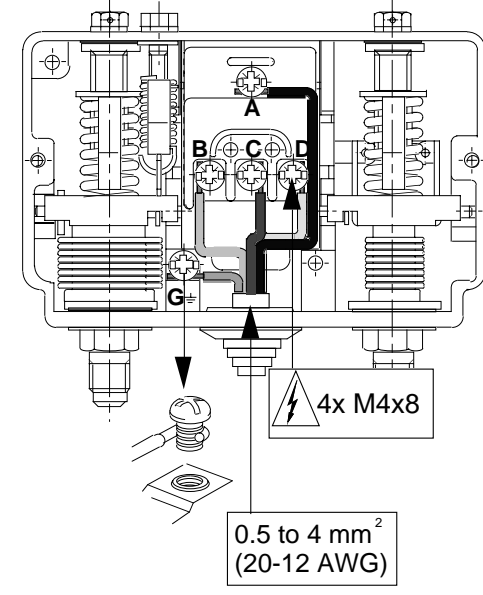
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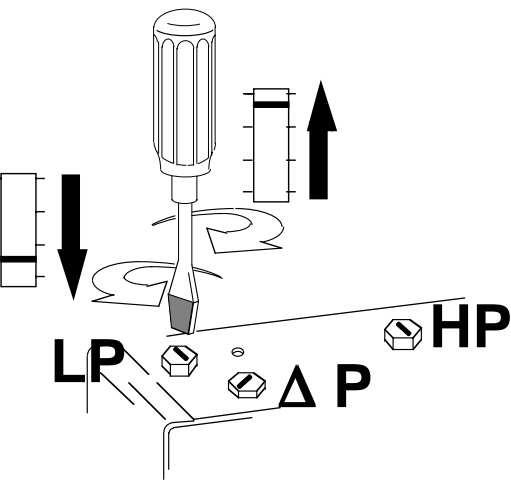
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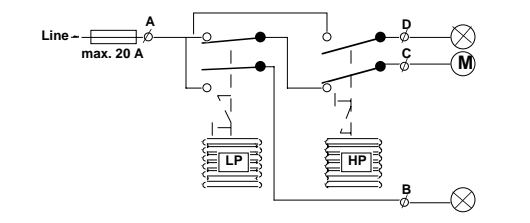
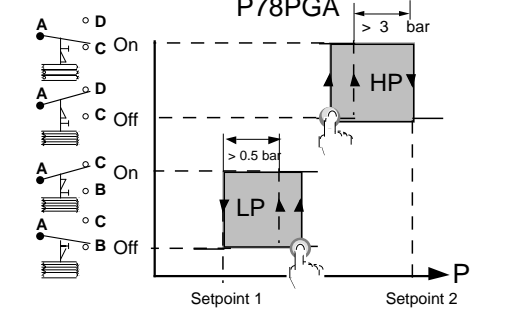
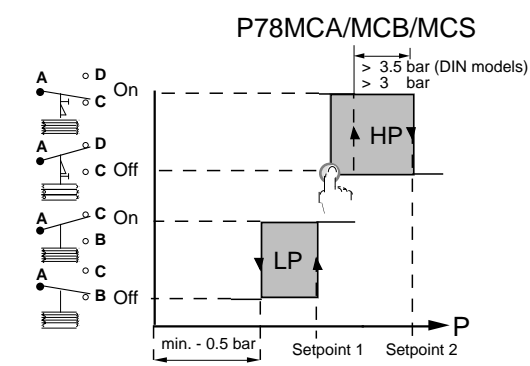
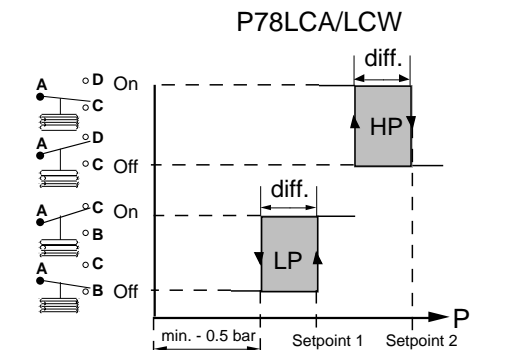
Wiring Bedrading Kabling Καλωδίωση Zapojení	Raccordement Cableado Cablagem	Verdrahtung Cablaggio Ledningar Elektrisk installation
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Adjustment Instelling Ajuste Justerung Seřízení	Réglage Ajuste Justerung Justerung	Einstellung Regolazione Säätö Ρύθμιση
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Adjustment Instelling Ajuste Justerung Seřízení	Réglage Ajuste Justerung Justerung	Einstellung Regolazione Säätö Justerung
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Specification Specificatie Especificação Beskrivelse Technická data	Description Descripción Descrição Beskrivelse Technická data	Spesifikation Specifiche Erittely Προδιαγραφές
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Electrical rating:
contact A-C: 16(10) A, 400V - 8 (5)A, 400V - 230 V ~, 12W (pilot duty only)
contact A-B and A-D:
Enclosure:
Amb. temp. limits: IP54 according to DIN 40050 and IEC 144
-50 to +55 °C for standard models
-20 to +55 °C for DIN approved models (+70°C max. duration two hours)
-50 to +55 °C
Storage temp.: All high pressure bellows: 33 bar
Max. bellows press.: All low pressure bellows: 22 bar except NH3 (ammonia) LP side: 14 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, LP side (LP)
- 2 Differential adjustment screw, LP side (not on P78PGA-xxx models) (ΔP)
- 3 Setpoint indicator, LP side
- 4 Differential indicator, LP side (not on P78PGA-xxx models)
- 5 Lock plate (if applied)
- 6 Lock screw (if applied)
- 7 Reset button (only manual reset models)
- 8 Setpoint adjustment screw, HP side (HP)
- 9 Setpoint indicator, HP side
- 10 Drainhole

The P78 is a pressure control designed to sense pressure of non-corrosive refrigerants. The P78xxx-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, côté LP (faible pression)(LP)
2. Vis de réglage du différentiel, côté LP (faible pression) (pas sur les modèles P78PGA-xxx) (ΔP)
3. Indicateur de consigne, côté LP (faible pression)
4. Indicateur du différentiel, côté LP (faible pression) (pas sur les modèles P78PGA-xxx)
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. Vis de réglage de la consigne, côté HP (haute pression) (HP)
9. Indicateur de consigne, côté HP (haute pression)
10. Perçage de drainage

Le modèle P78 est un régulateur de pression destiné à détecter la pression de réfrigérants non corrosifs. Les séries P78xxx-97xx conviennent également dans l'emploi d'applications d'ammoniacque.

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, Niederdruckseite(LP)
- 2 Differentialeinstellschraube, Niederdruckseite (Nicht bei Modellen P78PGA-xxx) (ΔP)
- 3 Sollwertanzeige, Niederdruckseite
- 4 Differentialanzeige, Niederdruckseite (Nicht bei Modellen P78PGA-xxx)
- 5 Sicherungsscheibe (falls zutreffend)
- 6 Sicherungsschraube (falls zutreffend)
- 7 Rückstellaste (Nur Modelle mit manueller Rückstellung)
- 8 Sollwertinstellschraube, Hochdruckseite(HP)
- 9 Sollwertanzeige, Hochdruckseite
- 10 Drainage-Öffnung

Der P78 ist ein Druckregler zum Fühlen des Drucks nichtagressiver Kühlmittel. Die Baureihe P78xxx-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

Hinweis
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 feindrähtiger 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, LP zijde(LP)
- 2 Differentie instelschroef, LP zijde (niet op P78PGA-xxx modellen) (ΔP)
- 3 Setpoint aanwijsschaal, LP zijde
- 4 Differentie aanwijsschaal, LP zijde (niet op P78PGA-xxx modellen)
- 5 Borgplaat (indien meegeleverd)
- 6 Borgplaat schroef (indien meegeleverd)
- 7 Reset drukknop (alleen op man. reset modellen)
- 8 Setpoint instelschroef, HP zijde (HP)
- 9 Setpoint aanwijsschaal, HP zijde
- 10 Condens afvoeropening

De P78 is een pressostaat ontworpen voor het meten van drukken van niet corrosive koelmiddelen. De P78xxx-97xx series zijn ook te gebruiken voor ammoniak toepassingen.

Volgens EN 60730 is het een type 1 actie 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.

