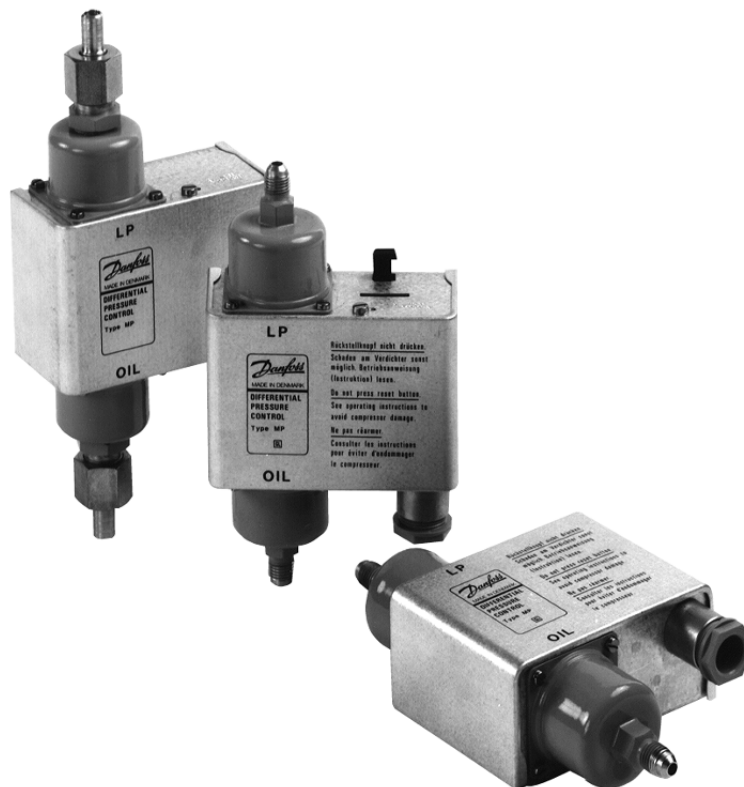


## Technical leaflet

### Differential pressure controls Type MP 54, 55 and 55A



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**Introduction**

MP 54 and MP 55 oil differential pressure controls are used as safety switches to protect refrigeration compressors against low lubricating oil pressure.

If the oil pressure fails the oil differential pressure control stops the compressor after a certain time period.

MP 54 and 55 are used in refrigerating systems using fluorinated refrigerants.

MP 55A is used in refrigerating systems with R 717 (NH<sub>3</sub>). MP 55A can also be used in systems with fluorinated refrigerant.

MP 54 has a fixed differential pressure setting. It also incorporates a thermal time relay with a fixed release time setting.

MP 55 and 55A have adjustable differential pressure and are available both with and without thermal time relay.


**Features**

- *Wide regulating range*  
Can be used for deep freeze, refrigeration and air conditioning plant
- *Can be used for all normal fluorinated refrigerants*
- *Electrical connection at the front of the unit*
- *Suitable for both alternating and direct current*
- *Screwed cable entry for cables from 6 to 14 mm diameter*
- *Small contact differential*
- *Meets the requirements of EN 60947*

**Approvals**

- Ⓓ DEMKO, Denmark
- Ⓔ NEMKO, Norway
- Ⓕ FIMKO, Finland
- Ⓓ DSRK, Deutsche-Schiffs-Revision und -Klassifikation, Germany
- Ⓐ Polski Rejestr Statków, Poland
- Ⓒ Germanischer Lloyd, Germany

EZU, The Czech Republic  
RINA, Italy  
CE mark according to EN 60947-5

Versions having UL and CSA approvals can be supplied to special order.

**Materials in contact with the medium**

Unit type	Material
MP 54 MP 55	Stainless steel 19/11, no. 1.4306 to DIN 17440 Deep-drawn steel plate, no. 1.0338 to DIN 1624 Free cutting steel, no. 1.0718 to DIN 1651
MP 55A	Stainless steel 19/11, no. 1.4306 to DIN 17440 Deep-drawn steel plate, no. 1.0338 to DIN 1624 Free cutting steel, no. 1.0401 to DIN 1652

**Technical data**

**Control voltage**  
230 V or 115 V a.c. or d.c.

**Permissible voltage variation**  
+10 → -15%

**Max. working pressure**  
PB = 17 bar

**Max. test pressure**  
p' = 22 bar

**Temperature compensation**  
The time relay is temperature-compensated in the range -40 to +60°C

**Screwed cable entry**  
Pg 13.5

**Cable diameter**  
6 → 14 mm

**Max. bellows temperature**  
100°C

**Enclosure**  
IP 20 to IEC 529

**Contact loads**

Type A:  
On time relay output contacts M-S:  
AC15: 2 A, 250 V  
DC13: 0,2 A, 250 V

Type B without time relay:  
AC15: 0,1 A, 250 V  
DC13: 12 W, 125 V

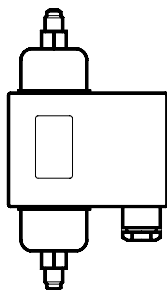
Type C without time relay:  
AC1: 10 A, 250 V  
AC3: 4 A, 250 V  
DC13: 12 W, 125 V

**Properties according to EN 60947:**

Wire dimensions		
solid/stranded		0.2 - 1.5 mm <sup>2</sup>
flexible, w/out ferrules		0.2 - 1.5 mm <sup>2</sup>
flexible, with ferrules		0.2 - 1 mm <sup>2</sup>
Tightening torque		max. 1.2 NM
Rated impulse voltage		4 kV
Pollution degree		3
Short circuit protection, fuse		2 Amp
Insulation		250 V
IP		20

**Ordering**
**For fluorinated refrigerants**

Type	Differential $\Delta p$ bar	Switch differential max. $\Delta p$ bar	Operation range, LP side bar	Time relay release time s	Contact load (see technical data)	Code no.		
						Connection		
						1/4 in./6 mm Flare	1 m cap.tube 1/4 in. ODF solder	Cutting ring 6 mm
MP 54	Fixed 0.65	0.2	-1 → +12	0 <sup>2)</sup>	B	<b>060B0297</b>		
	Fixed 0.65	0.2	-1 → +12	45	A	<b>060B0166</b>		
	Fixed 0.9	0.2	-1 → +12	60	A	<b>060B0167</b>		
	Fixed 0.65	0.2	-1 → +12	90	A	<b>060B0168</b>		
	Fixed 0.65	0.2	-1 → +12	120	A	<b>060B0169<sup>3)</sup></b>		
MP 55	0.3 → 4.5	0.2	-1 → +12	45	A	<b>060B0170</b>	<b>060B0133</b>	
	0.3 → 4.5	0.2	-1 → +12	60	A	<b>060B0171</b>	<b>060B0134</b>	<b>060B0188</b>
	0.3 → 4.5	0.2	-1 → +12	60	A	<b>060B0178<sup>1)</sup></b>		
	0.3 → 4.5	0.2	-1 → +12	90	A	<b>060B0172</b>		
	0.3 → 4.5	0.2	-1 → +12	120	A	<b>060B0173</b>	<b>060B0136</b>	
	0.3 → 4.5	0.2	-1 → +12	0 <sup>2)</sup>	B	<b>060B0299</b>		<b>060B0295</b>
	0.65 → 4.5	0.4	-1 → +12	0 <sup>2)</sup>	C	<b>060B0294<sup>4)</sup></b>		


**For fluorinated refrigerants and R717 (NH<sub>3</sub>)**

Type	Differential $\Delta p$ bar	Switch differential max. $\Delta p$ bar	Operation range, LP side bar	Time relay release time s	Contact load (see technical data)	Code no.	
						Connection	
						∅ 6,5 / ∅ 10 mm weld nipple	Cutting ring 6 mm
MP 55A	0.3 → 4.5	0.2	-1 → +12	45	A	<b>060B0174</b>	<b>060B0182</b>
	0.3 → 4.5	0.2	-1 → +12	60	A	<b>060B0175</b>	<b>060B0183</b>
	0.3 → 4.5	0.2	-1 → +12	60	A	<b>060B0179<sup>1)</sup></b>	
	0.3 → 4.5	0.2	-1 → +12	90	A	<b>060B0176</b>	<b>060B0184</b>
	0.3 → 4.5	0.2	-1 → +12	120	A	<b>060B0177</b>	<b>060B0185</b>
	0.3 → 4.5	0.2	-1 → +12	0 <sup>2)</sup>	B	<b>060B0298<sup>2)</sup></b>	<b>060B0296</b>

<sup>1)</sup> With operational light that remains on during normal operation.

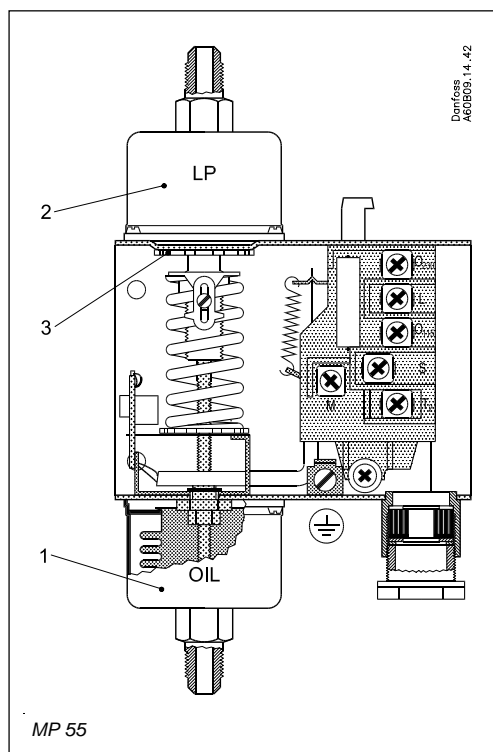
**Note:** If the operational light goes out, the compressor should not run longer than the release time.

<sup>2)</sup> Versions without time relay are for applications where an external time relay is required - perhaps with a different release time than the one specified.

<sup>3)</sup> 060B0169 meets Copeland specifications. UL-approved versions can be supplied.

<sup>4)</sup> Approved according to EN 60947-4, -5.

**Design**



1. Connection to pressure side of lubrication system, OIL
2. Connection to suction side of refrigeration plant, LP
3. Setting disc
4. Reset button
5. Test device

The operation of the pressure control is conditional only on the differential pressure, i.e. the difference in pressure between the two counteracting bellows, whereas it is independent of the absolute pressure acting on both bellows.

The MP 55 and 55A can be set for different differential pressures by the setting disc (3). The set differential pressure can be read from the internal scale.

The MP 54 has a fixed differential and has no pressure setting disc. The factory-set differential pressure is stamped on the front plate of the control.

**Terminology**

*Differential range*

The pressure difference between LP and OIL connections within which the control can be set to operate.

*Scale reading*

The differential between the oil pump pressure and the pressure in the crankcase that exists at the moment the contact system cuts in current to the time relay on falling oil pressure.

*Operating range*

The pressure range on the LP connection within which the control can operate.

*Contact differential*

The pressure rise above the set differential pressure (scale reading) necessary to cut off current to the time relay.

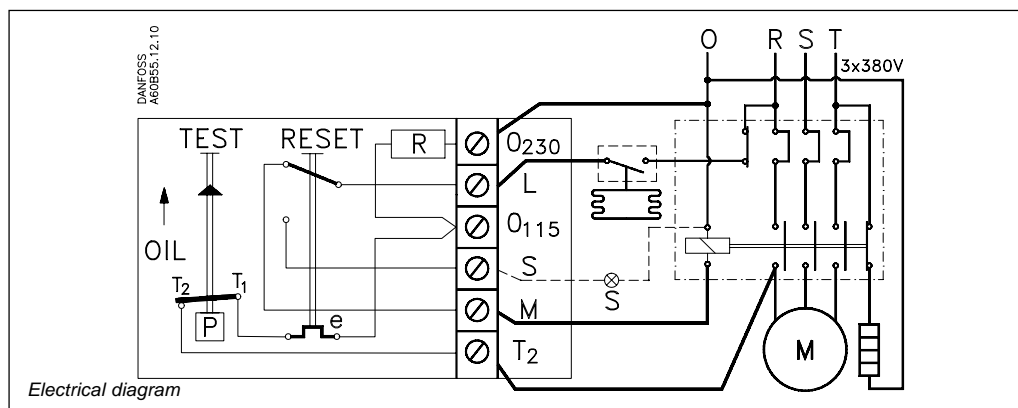
*Release time*

The period for which the differential pressure control allows the compressor to run with too low an oil pressure during start-up and operation.

**Function**

If there is no oil pressure on starting, or if the oil pressure falls below the set pressure during operation, the compressor will stop after the release time has elapsed. The electrical circuit is divided into two completely separate circuits, a safety circuit and an operational circuit.

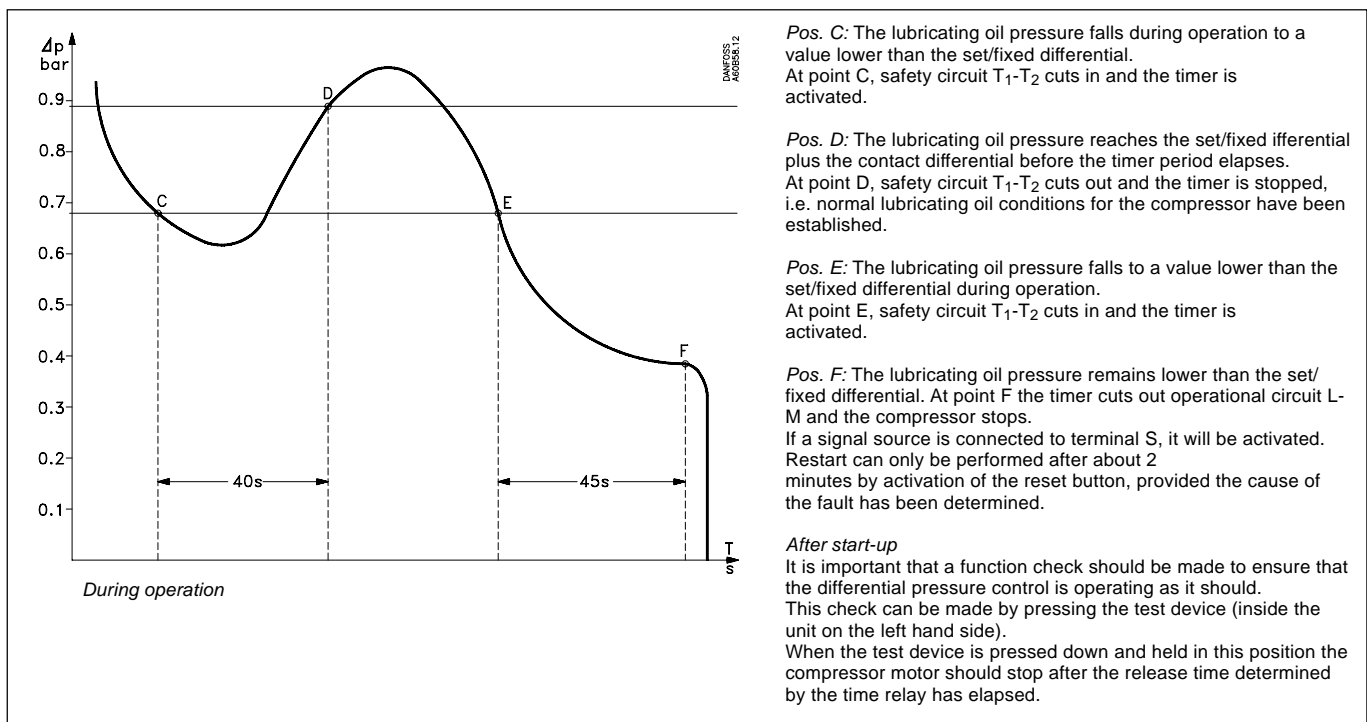
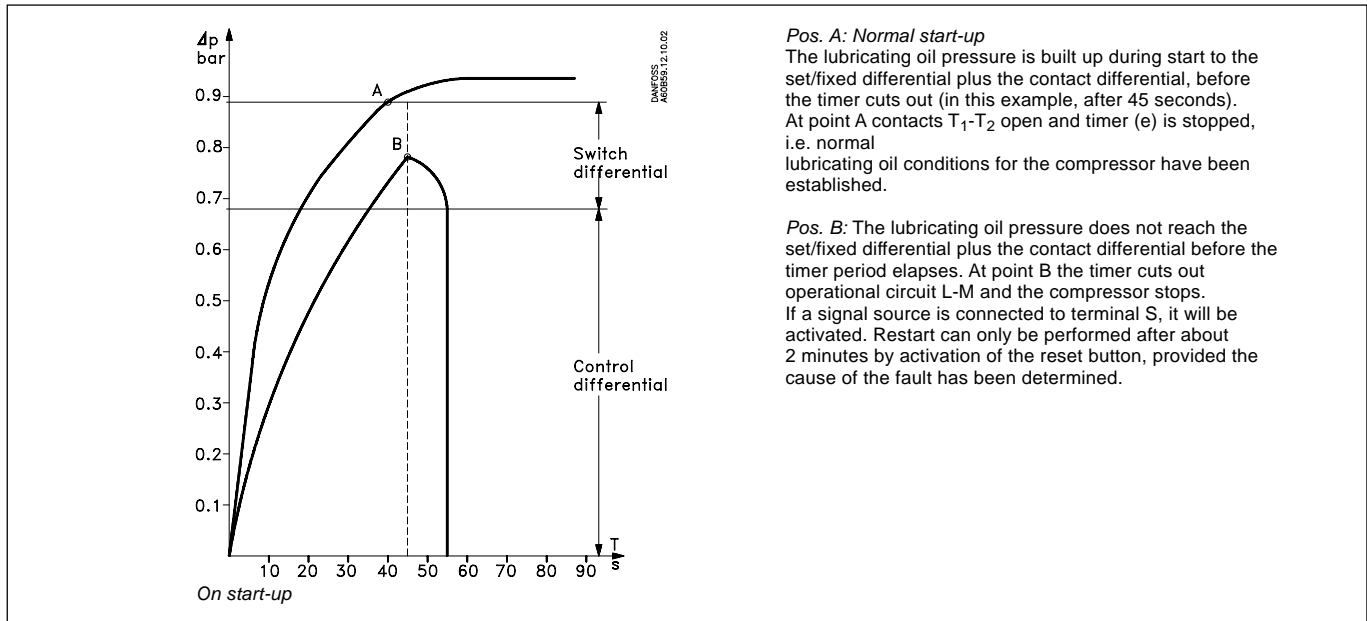
The timer (e) in the safety circuit is activated when the effective lubricating oil pressure, *the oil differential pressure* (the difference between the oil pump pressure and suction pressure), is lower than the set value. The timer is deactivated when the oil differential pressure is more than the set value plus the contact differential.



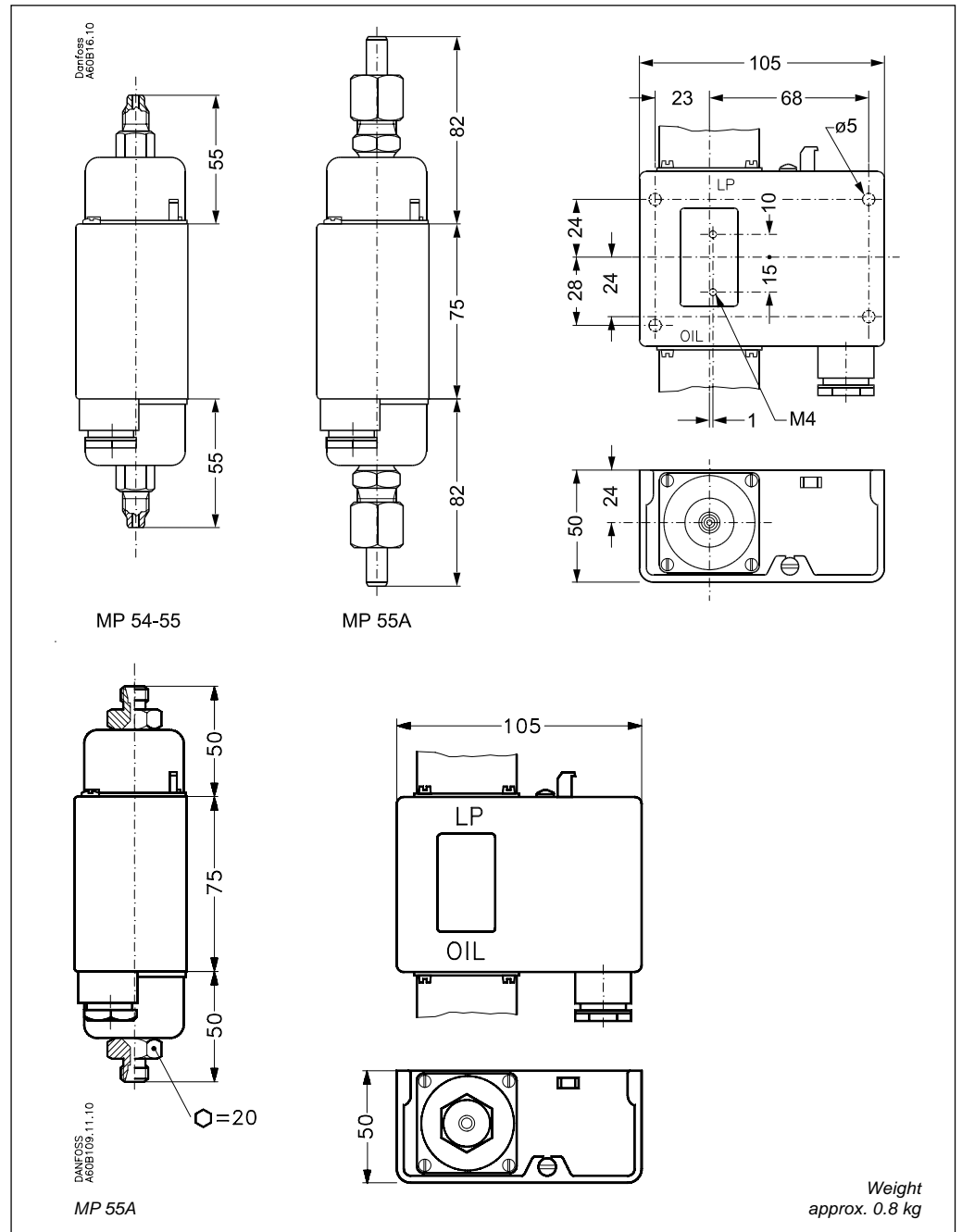
**Function**  
(continued)

The two diagrams below explain the terms "oil differential pressure" and "contact differential", both have to be considered when using oil differential pressure controls.

The first diagram shows the function of the differential control during start; the second shows the function of the control during operation.



Dimensions and weight



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