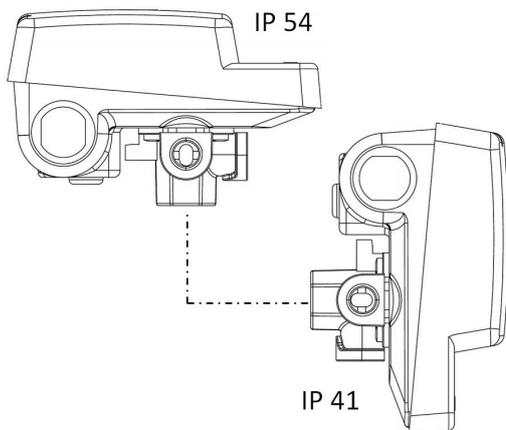
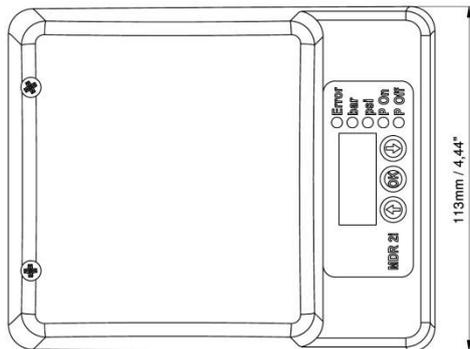
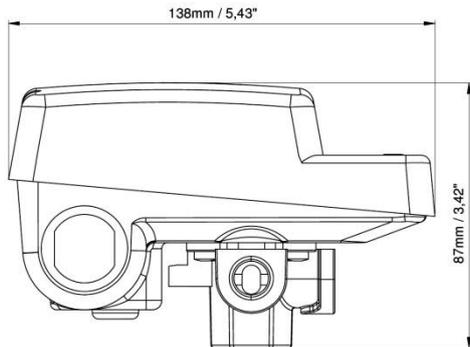




OPERATING INSTRUCTIONS MDR-2i

Condor pressure switches were built according to the relative and approved regulations of the time period when they were developed and produced and are considered to be safe during operation. However, this device can present risks if it is used by personnel without specialist training, or is used inappropriately or in an unapproved manner. The safety data sheet and the local legal regulations are to be strictly observed. The pressure switches serve the surveillance and control of processes, operations of pumps and compressors in dependence on the prevailing pressure.



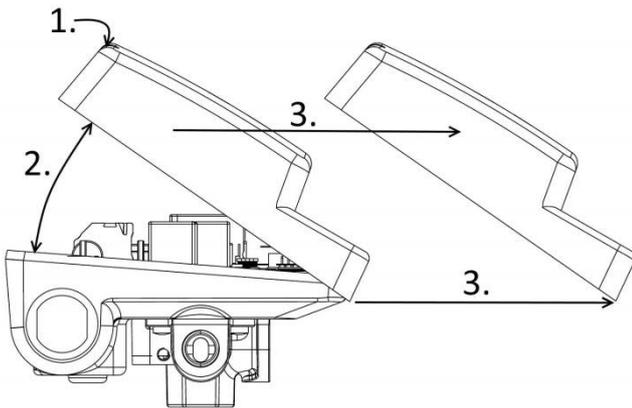
Technical Data (DIN EN 60947-4-1)	
Rated operational current I _e (U _e = 250 V, AC 3)	16 A
Rated voltage	85...265V
Rated frequency	50 Hz / 60 Hz
Rated insulation voltage U _i	500 V
Dielectric strength	1500VAC
Degree of protection of individual enclosure	IP 54 / IP 41
Pollution degree	3
Protection class	I
Mechanical durability operating cycles	> 1 x 10 ⁶
Maximum switching frequency operating cycles / h	300
Electrical durability (AC 3) operating cycles	> 1 x 10 ⁵
Permissible medium temperature (air)	-20°C ... +70°C
Ambiente temperature	-5°C ... 50°C
Contact material	AgSnO ₂
Co-ordination type	2
Connection data (Line + Motor)	0,08 .. 4mm ²
Auxiliary contact/ unloader valve (100.000 cycles)	
250V AC 12	5A
30V DC 12	5A
Contact material	AgNi90/10, AgSnO ₂
Connection data	0,08 .. 2,5mm ²

Ratings (UL 508, 100,000 Cycles)	
Load:	
120 VAC	1HP
240 VAC	2HP
120/240 VAC, 15 FLA, 90 LRA – Definite Purpose	
Wire range: 28 ...12 AWG, Cu, 75 °C	
AUX Load:	
240 VAC/30 VDC	5A Resistive
B300	
Wire range: 28 ...12 AWG, sol/STR, Cu, 75 °C	

Pressure range:	
Switch off:	0,4 ... 16,0 bar 6 ... 232 psi
Switch on:	0,2 ... 15.8 bar 3 ... 229 psi
<i>The pressure range can be reduced in the Limits menu.</i>	



Cover disassembling and assembling:



Disassembling:

Step 1:

unscrew the two cover screws
- screwdriver PH1

Step 2:

approx. 30° rotary movement as shown left

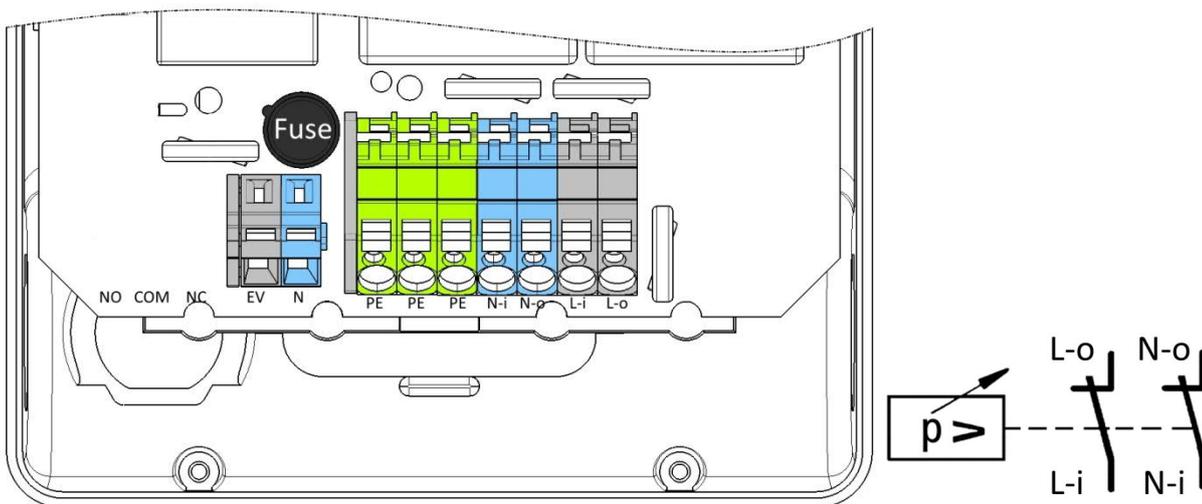
Step 3:

move cover sideways, the sealing ring has to stay at the lower part of the housing

The assembling has to be done in the opposite way

For Use with Flexible Conduit only or equivalent or instructions indicating that the conduit hub shall be installed prior to connecting the rigid conduit or equivalent.

Wiring diagram



Line and Motor connection:

Connect the main supply to: PE, N-i (Neutral in), L-i (Line in)

Motor wiring has to be connected to: PE, N-o (Neutral out), L-o (Line out)

Unloader connection:

The unloader has to be connected to the PE, EV and N terminals. The EV terminal is switched, the N terminal is directly connected to the N-i terminal.

Fuse:

The unloader valve relay is protected by a changeable fuse. Data: 250V T1A

Software description

MDR-2i

Pressure display

System pressure normally uses bar (00.0–16.0)
or psi (000–232) as display units.

The selected unit is indicated with an additional LED.

Switch-on pressure adjustment

The configured switch-on pressure is displayed by pressing the 'Down arrow' key. In addition, the 'P on' LED also lights up.

Calibration: Press the 'Down arrow' key first, the P On LED will light up now.

Afterwards press the OK key, the display will show '888'. Now it is needed to press the 'Down arrow' for 3 seconds until the display starts to flash.

The value can now be set by using the arrow keys. Pressing the 'OK' key saves the value and calibration ends.



Switch-off pressure adjustment

The configured switch-off pressure is displayed by pressing the 'Up arrow' key. In addition, the 'P off' LED also lights up.

Calibration: Press the 'Up arrow' key first, the P Off LED will light up now.

Afterwards press the OK key, the display will show '888'. Now it is needed to press the 'Up arrow' for 3 seconds until the display will start to flash.

The value can now be set by using the arrow keys. Pressing the 'OK' key saves the value and calibration ends.



Standby

Press 'OK' for 3sec to switch between:

- Standby (display ' - ', the relay does not switch, regardless of pressure, the contacts are open)
- and
- Online/ Auto (pressure display, normal operating behaviour).

Setup menu

If both arrow keys are pressed and held for more than 5 sec, the controller switches to the Setup menu. On the display, '5Et' => **SETUP** appears for 1 sec. You can now release the keys. The first menu option is shown.

The arrow keys can be used to page forwards and backwards through the menu.

Use 'OK' to select a menu option.

You can exit from the Setup menu by selecting the menu option 'End'.

Pressure unit

Use the menu option 'PrU' => **Pressure Unit** to switch between 'bAr' and 'P51'. The corresponding LED also flashes: use the arrow keys to change the setting and use 'OK' to save.

Discharge valve

Menu option 'd0n' => discharge **On**

This is used to configure the opening time of the discharge valve during compressor start-up.

Possible values 000 (= deactivated) – 020 sec

The discharge relay switches one second before switching on the compressor relay for the configured duration.

Menu option 'd0F' => discharge **OFF**.

This is used to configure the opening time of the discharge valve during compressor shutdown.

Possible values 000 (= deactivated) – 020 sec

The discharge relay switches on after the compressor relay is switched off for the configured duration and then switches off again.

Note: This option is only working with "NC-valves". NO valves are discharging all the time when the compressor is not running

Standby

Menu option '5tb' => **Standby**.

You can configure a time in minutes here. If the pressure has not dropped below the switch-on pressure during the configured time, the controller switches automatically to standby. A switching cycle resets the time counter. Configurable time 000 (= deactivated) – 999 min.

Dry run

Menu option 'drY' => **dry run**.

You can configure a time in minutes here. If the switch-on pressure has not been reached during the configured time, a corresponding error (see below) is reported. Configurable time 000 (= deactivated) – 999 min.

Max. run time

Menu option 'run' => max. **run time**.

You can configure a time in minutes here. If the switch-off pressure has not been reached during the configured time, a corresponding error (see below) is reported. Configurable time 000 (= deactivated) – 999 min.

Maximum Switching frequency

Menu option 'CYt' => **Cycle time**.

Menu option 'CYc' => **Cycle count**.

You can configure a time in minutes and a number of switching cycles here. If the relay is switched more often during the configured time than the configured cycle count, a corresponding error (see below) is reported. Configurable time 000 (= deactivated) – 059 min/000 – 999 cycles

Service settings

Menu option '5Er' => **Service**.

You can set cycle counters and runtimes in this menu.

Runtime relay 1 and 2

Menu option '5t1' => **Service time relay 1**

Menu option '5t2' => **Service time relay 2**

You can configure a time in hours here: after this time, a service alarm is triggered if the corresponding relay has run for this period of time. 000 = deactivated.

Switching cycles relay 1 and 2

Menu option '5C1' => Service Counter relay 1

Menu option '5C2' => Service Counter relay 2

You can configure a counter value here: after this time, a service alarm is triggered if the corresponding relay has exceeded this number of cycle counts. 000 = deactivated.

Runtimes and switching cycles

Menu option 't-C' => time and Counters

You use this menu to monitor and delete hours of operation and cycle counters.

Time on power

Menu option 'tPo' => time Power on

Displays the time the controller has spent on the power supply in hours.

A 6-digit display is used: the leftmost 3 digits (no decimal point) and the rightmost 3 digits (decimal point at far right) are displayed one after the other.

Main relay time

Menu option 'tr1' => time relay 1

Displays the switch-on time of the main relay in hours.

A 6-digit display is used: the leftmost 3 digits (no decimal point) and the rightmost 3 digits (decimal point at far right) are displayed one after the other.

Auxiliary relay (unloader relay) time

Menu option 'tr2' => time relay 2

Displays the switch-on time of the auxiliary relay in hours.

A 6-digit display is used: the leftmost 3 digits (no decimal point) and the rightmost 3 digits (decimal point at far right) are displayed one after the other.

Power switching cycles

Menu option 'CPo' => Counter Power

Shows power outages affecting the controller.

A 6-digit display is used: the leftmost 3 digits (no decimal point) and the rightmost 3 digits (decimal point at far right) are displayed one after the other.

Main relay switching cycles

Menu option 'Cr1' => Counter relay 1

Shows the switching cycles for the main relay.

A 6-digit display is used: the leftmost 3 digits (no decimal point) and the rightmost 3 digits (decimal point at far right) are displayed one after the other.

Auxiliary relay switching cycles

Menu option 'Cr2' => Counter relay 2

Shows the switching cycles for the auxiliary relay.

A 6-digit display is used: the leftmost 3 digits (no decimal point) and the rightmost 3 digits (decimal point at far right) are displayed one after the other.

Calibration

note: the sub menu is password protected

Menu option 'CAL' => Calibration

For one second "PAS" is shown on the display to request the password. Wrong passwords cause "Err" messages.

Calibration of Pressure sensor offset

Menu option 'OFF' => Offset Steps:

- The switch needs to be unpressurized
- Use 'OK' to confirm that the offset will be calibrated
- Use arrow keys to set the security query from 'n0' =>NO to 'YE5' => Yes
- Use 'OK' to finalize the offset calibration. The ADC- Value is shown afterwards in a six-figure sum for 1sec.

Calibration of Pressure sensor scaling factor

Menu option '5cA' => Scale Steps:

- The switch needs to be pressurized to a fixed pressure
- Use 'OK' to confirm that the scale will be calibrated
- Use arrow keys to set the security query from 'n0' =>NO to 'YE5' => Yes
- Use arrow keys to specify the fixed pressure
- Use 'OK' to finalize the scale calibration. The ADC- Value is shown afterwards in a six-figure sum for 1sec.

Show Pressure sensor offset

Menu option '5H0' => SHOW Offset

Displace the stored offset value

Show Pressure sensor scaling factor

Menu option '5H0' => SHOW Scale

Displace the stored scale value

Raw value of pressure sensor

Menu option 'A-d' => A/D value

The A/-D- converter value (raw value) is shown in a six-figure sum for 3sec.

Leave sub menu

Menu option 'End' => End / leave Calibration menu

Software version

Menu option '50F' => SOFTWARE

Software version is shown for 3 sec. Example: "1.25"

Menu option 'L1N' => LIMits

note: the sub menu is password protected

For one second "PAS" is shown on the display to request a password. Wrong passwords cause "Err" messages.

Opens a submenu to specify the allowed pressure range and the unloader Valve function

Specify the minimum pressure setting of cut in

Menu option 'POn' => minimum Pressure On (cut in) setting

The value/ pressure can be set by using the arrow keys between 003 and 229 psi.

Specify the maximum pressure setting of cut out

Menu option 'POF' => maximum Pressure OFF (cut out) setting

The value/ pressure can be set by using the arrow keys between 006 and 232 psi.

Specify the minimum pressure hysteresis /difference between cut in and cut out

Menu option 'PhY' => minimum Pressure hysteresis setting

The value/ pressure can be set by using the arrow keys between 003 and 020 psi.

Specify the unloader function

Menu option 'ULu' = UnLoader valve

Use arrow keys to choose between 'nO' (normally Open) and 'nC' (normally Closed) unloader valves.
Use 'OK' to finalize the unloader selection.

*Notes: Normally Open valves need to be powered to close the valve during the compressor is running.
Normally Closed valves need to be powered to unload when the compressor motor stops.*

Leave sub menu

Menu option 'End' => End / leave Limits menu

Error messages

If an error message occurs, it will be flashing on the display and the red error LED will light up. The error can be acknowledged by pressing "OK".

Error due to external influences:

- E01 Dry running - the set switch-on pressure was not reached after the start in ["" min]. The relay outputs are deactivated. This error must be acknowledged by OK.
- E02 Max. Running time - the set switch-off pressure was not reached after the start in ["" min]. The relay outputs are deactivated. This error must be acknowledged by OK.
- E03 Max. Switching operations - during the monitoring time of ["" min] the relay switches more than ["" times]. The relay outputs remain in function. This error must be acknowledged by OK.
- E11 Negative pressure at the sensor - The pressure at the sensor falls below the min. permissible value of the sensor. The relay outputs remain in function. Error acknowledges itself if value returns within the valid range.
- E12 Overpressure on the sensor - The pressure on the sensor exceeds the max. permissible value of the sensor. The relay outputs are deactivated. Error acknowledges itself if value returns within the valid range.
- E21 Under temperature - The temperature falls below the min. permissible value. The relay outputs remain in function. Error acknowledges itself if value returns within the valid range.
- E22 Overtemperature - The temperature exceeds the max. permissible value. The relay outputs remain in function. Error acknowledges itself if value returns within the valid range.

Error sensor:

- E30 Sensor error Pressure - The pressure sensor (or the A / D converter) does not provide a valid value. The relay outputs are deactivated. Error acknowledges itself if the communication to the sensor is ok again.
- E31 Calibration error pressure - offset value outside the valid range. The relay outputs are deactivated. Recalibrate offset.
- E32 Calibration error pressure - Scaling value outside the valid range. The relay outputs are deactivated. Recalibrate scale value.
- E40 Sensor error temperature - The temperature sensor does not supply a valid value. The relay outputs are deactivated. Error acknowledges itself if the communication to the sensor is ok again.
- E 50 Error μ Controller EEPROM. There is no valid record in the EEPROM. The relay outputs are deactivated. Please contact the service.

Maintenance Notes:

- E 91 Maintenance interval reached - The adjustable maximum switching cycles of relay 1 have been exceeded. Servicing the unit due to many starts required. The relay outputs remain in function. To reset the error, increase or disable the service value or delete the switching play counter for relay 1.
- E92 Maintenance interval reached - The maximum adjustable switching cycles of relay 2 have been exceeded. Service of the valve due to many starts required. The relay outputs remain in function. To reset the error, increase or disable the service value or delete the switching cycle counter for relay 2.
- E93 Maintenance interval reached - The adjustable maximum operating time of relay 1 has been exceeded. Servicing the unit due to many hours of operation required. The relay outputs remain in function. To reset the error, increase or disable the service value or delete the operating hours counter for relay 1.
- E94 Maintenance interval reached - The adjustable maximum operating time of relay 2 has been exceeded. Service of the valve required due to many operating hours. The relay outputs remain in function. To reset the error, increase or disable the service value or delete the operating hours counter for relay 2.
- Note: multiple errors will be shown alternately



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