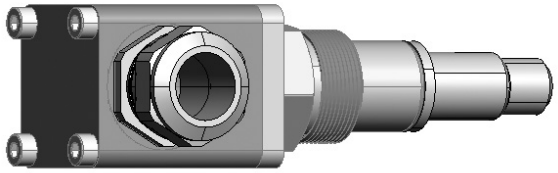
Product Data Sheet
SD 2000-0E04
August 2008

Damcos® DPI-C and DPI-E
Position indicators



Damcos®

EMERSON™
Process Management

Damcos® DPI-C and DPI-E

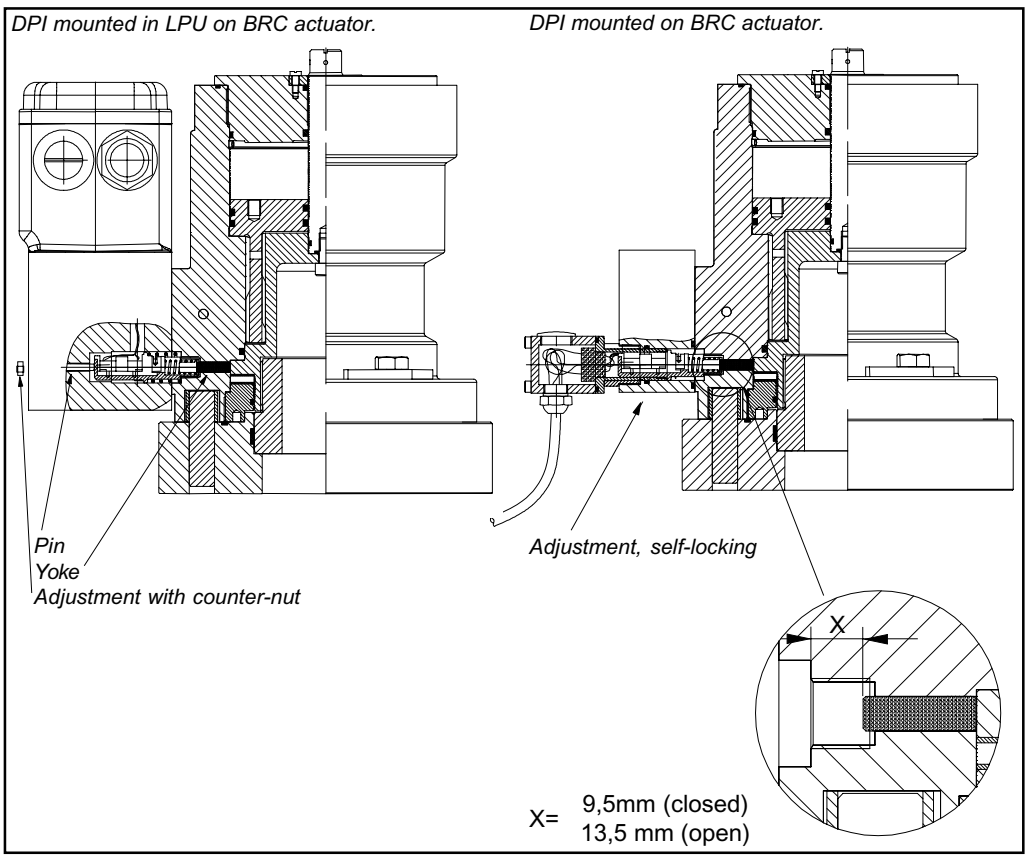
Description

The DPI is designed to fit DMS quarterturn valve actuators BRC and BRCF for use within the temperature range from -20° C to +80° C.
The DPI range consists of the DPI-E (ON/OFF/switches), DPI-C (Continuous/potentiometer) and the hydraulic DPI-B (By-pass). For further information about the DPI-B, please see separate data sheet.

Basic design

The DPI-E and -C can be mounted in different mounting blocks or in LPU, with only internal wiring. Valve/actuator position is indicated by means of a precision potentiometer or 2 micro-switches.

Resistance (commonly used Ω output) increases during opening and decreases during closing the valve/actuator.
Set point adjustment is performed without dismounting the DPI or cable from the LPU or block.



Mounting and adjustment

When mounting the DPI-C/-E be sure not to press the DPI too far towards the actuator. Several misadjustments of the DPI may cause destruction of the DPI.
When the valve/actuator is closed you may adjust the DPI by screwing it towards the actuator until the...

- if DPI-C: - potentiometer reaches the desired 300 Ω (1500 Ω), or
- if DPI-E: - CLOSED switch closes (opens if NC configuration),

and then adjust the desired overlap (1° - 5°).

Check the indicator signal in open position.

When DPI is mounted in a block, make sure that the locking screw is tightened sufficiently to prevent the DPI from turning.

When mounted in LPU remember to tighten the counter-nut.

If correct adjustment is not possible - check the yoke distance “X” (see enlargement), and the presence of the yoke.

Enclosure rating

When mounted in block:
Cavity seals are designed to fulfil demands of enclosure rating IP 68.
Note: In case of installation where a larger enclosure rating than IP 67 is required, the connection house should be filled with silicone after wire mounting and test of function.
With each actuator comes a yoke, fit to transfer the mechanical signal from the actuator to the DPI.

Potentiometer

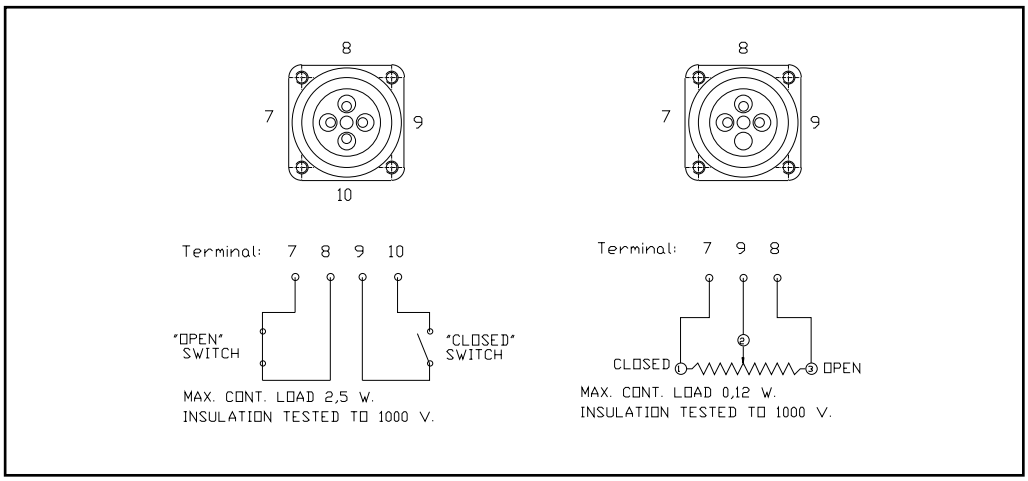
The potentiometer incorporated in the DPI-C is a high quality potentiometer that is extremely reliable as long as the following ratings are observed:

Max. continuous load:		0.12 W (VA)
Max. peak load:		1 W(VA)
The normal output range is at	1 kΩ:	0-500 Ω for 0-90° rotation*
	2 kΩ:	300-1400 Ω for 0-90° rotation*
	10 kΩ:	1500-7000 Ω for 0-90° rotation*

Approx. adjustment for open (1400/7000) and close (300/1500) set point.

Damcos® DPI-C and DPI-E

Terminal layout



Analogue signal processing

LPU is equipped with signal conditioning, with a 2-wire 4 - 20 mA signal output. When DPI-C is block mounted we recommend the DMS isolation amplifier 2204 for transforming the resistance signal into a standard 4-20 mA signal.

The output can be displayed visually by means of the DMS meter PQ 48 measuring 48 x 48 mm and scaled: “closed, ¼, ½, 3/4, open”.

Materials

Housing:	Brass, MS 58 (CuZn39Pb3)
Screws:	AISI 304
Seals:	NBR ~ Acrylonitrile Butadiene
Fixture:	PPS

Cable gland data

Cable outer diameter:	ø 6-10.5 or ø 8-15 mm
Ingress protection:	IP 68
Thread:	M 16 or M 20
Material:	Nickel plated brass
Seal material:	Perbunan and NBR

Cable quality/connection

Wiring to the terminal: Cross sections 0.5-1.5 mm² (AWG 22 - 16).
Observe that water intrusion into the terminal housing can take place through the cable - even through each individual wire.
The IP tightness is based on correct and careful mounting.

Potentiometer

Standard resistance values:	1k Ω, 2k Ω, 10k Ω
Total resistance tolerance:	Precision class ± 20%
Independent linearity tolerance:	Precision class ± 5%
Resolution:	Essentially infinite
Output smoothness:	Below 0.1% against input voltage
Insulation resistance:	Over 50 M Ω at 500 V DC
Dielectric strength:	1 minute at 500 V AC
Resistance temperature coefficient:	± 400 p.p.m./°C
Operating temperature range:	-55° C to +125° C
Temperature cycle: - Total resistance value variation: - No mechanical damage	5 cycles under -55° C to 125° C Below ±10%.
Exposure at low temperature: - Total resistance value variation: - No mechanical damage	24 hours at -55° C Below ± 5%.
Exposure at high temperature: - Total resistance value variation: - No mechanical and electrical damage	1,000 hours at 105° C Below ± 10%.
Vibration: - Total resistance value variation: - No mechanical and electrical damage	10 Hz to 2,000 Hz 20 G Below ± 2%.
Shock: - Total resistance value variation: - No mechanical and electrical damage	50 G 7 mS Below ± 1%
Moisture resistance: - Total resistance value variation: - Insulation resistance:	40° C 95% RH 120 hours Below ±10% Over 10 M Ω
Life expectancy:	500,000 cycles
Total resistance value variation:	Below ± 10% against initial value

Damcos DPI-C and DPI-E

Switches

Contact resistance:	Max. 100 m Ω
Switching current:	Max. 100 mA at 30 V DC resistive load
Dielectric strength:	1500 V AC to ground 1 minute
Life expectancy:	Min. 100,000 operations
Insulation resistance:	100 M Ω at 500 V DC
Humidity:	Max. 85%

This product is developed and managed by:
Emerson Process Management
Damcos A/S
Aaderupvej 41
DK-4700 Naestved
T +45 5578 7200
F +45 5578 7272

For global contacts:
www.EmersonProcess.com/marine

EMERSON
Process Management