AP... / BP... / DP... Limit Switches

Double Insulation - Plastic Casing IP65

Description

Applications

Easy to use, electromechanical limit switches offer specific qualities:

- Visible operation.
- Able to switch strong currents (10 A conventional thermal current).
- Electrically separated contacts.
- Precise operating points (consistency).
- Immune to electromagnetic disturbances.

They are purpose-built detection devices thanks to these characteristics:

- Presence/absence.
- Positioning and travel limit.
- Objects passing/counting.

Description

Limit switches, which are made of reinforced UL-VO thermoplastic fiber-glass, offer double insulation ⧈ and a degree of protection of IP65.

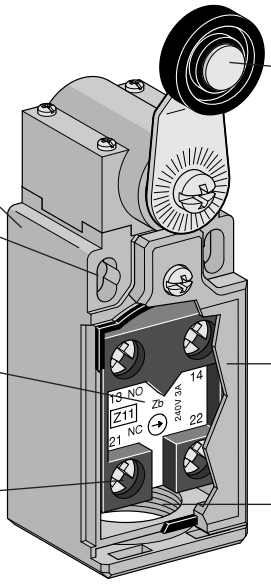
The casing come in 3 dimension: – AP... 30 mm. width – BP... 40 mm. width – DP... 50 mm. width

Casing
- 30 mm. width with standardized dimensions acc. to EN 50047
- 40 mm. width with standardized dimensions acc. to EN 50041
- 50 mm. width

Mounting the casing
- 2 x M4 screws on top part for 30 mm. width
- 2 or 4 x M5 screws for 40 mm. width
- 2 or 4 x M4 screws on top part for 50 mm. width

Contact Block:
- Contact configuration: NO + NC, 2 NO, 2 NC, 2NO + 1NC, 1NO + 2NC, 3NC, 3NO (only for BP series)
- Positive opening operation
- Snap action or slow action
- Contacts are electrically separated

Connecting terminals:
- Block of 2 contacts: M3.5 (+, –) pozidriv 2 screw
- Block of 3 contacts: M3 (+, –) screw
- Screw head with captive cable clamp
- Markings conform with IEC 60947-1, IEC 60947-5-1 standards



A variety of operating heads:
- Plain plunger
- Roller plunger
- Roller lever, adjustable or not, etc.

Assembled using 4 x ø 3 screws for 30 and 50 mm width.
Assembled using 4 x ø 4 screws for 40 mm width.

Cover:
- Closed using ø 3 screw for 30 and 50 mm width.
- Self clipping closure for 40 mm width.

One piece sealing gasket to ensure tightness.

Electrical connection:
- 1 x cable gland for AP series
- 1 x cable gland for BP series
- 2 x cable gland for DP series

Symbols

Example:	A	P	1	T	41	Z	1	1
Structure:		P						

Casing width:
A = 30 mm width + 1 cable inlet
B = 40 mm width + 1 cable inlet
D = 50 mm width + 2 cable inlets

Plastic casing

Electrical connection
1: cable inlets for PG13.5 cable gland
2: cable inlets for 1/2 NPT cable gland *
3: cable inlets for PG11 cable gland (only for AP and DP series)
4: cable inlets for M16 x 1,5 cable gland (only for AP and DP series)
5: cable inlets for M20 x 1,5 cable gland

Plastic heads
T: for AP and DP series
H: for BP series only

Operating heads: codes 10 - 9999

Contact block

11: 1 NO + 1 NC contacts
20: 2 NO contacts
02: 2 NC contacts
12P: 1 NO + 2 NC contacts
21P: 2 NO + 1 NC contacts
03P: 3 NC contacts

Only for BP series:
12: 1 NO + 2NC contacts
21: 2 NO + 1 NC contacts
03: 3 NC contacts
30: 3 NO contacts

Z: Snap action
W: Slow action (contact dependent)
X: Slow action non-overlapping late make
Y: Slow action overlapping early make

• **Ordering details** ..... page 18 to 29, page 40 to 44
• **Standards** ..... page 4
• **Terminology** ..... page 6

** In AP... and DP... series, the 1/2" NPT thread is obtained by the use of a plastic adapter (delivered not mounted).*

AP... / BP... / DP... Limit Switches

Double Insulation - Plastic Casing IP65

Technical Data

General Technical Data

		Plastic Casing
Standards		Devices conform with international IEC 60947-5-1 and European EN 60947-5-1 standards
Certifications - Approvals		UL - CSA - IMQ - EAC
Air temperature near the device		
– during operation	°C	– 25 ... + 70
– for storage	°C	– 30 ... + 80
Climatic withstand		According to IEC 60068-2-3 and salty mist according to IEC 60068-2-11
Mounting positions		All positions are authorised
Shock withstand (according to IEC 60068-2-27 and EN 60068-2-27)		50g* (1/2 sinusoidal shock for 11 ms) no change in contact position
Resistance to vibrations (acc. to IEC 60068-2-6 and EN 60068-2-6)		25g (10 ... 500 Hz) no change in position of contacts greater than 100 µs
Protection against electrical shocks (acc. to IEC 60536)		Class II
Degree of protection (according to IEC 60529 and EN 60529)		IP 65
Consistency (measured over 1 million operations)		0.1 mm (upon closing point)
Minimum actuation speed	m/s	Slow action contacts 0.060 / Snap action contacts 0.001

Electrical Data

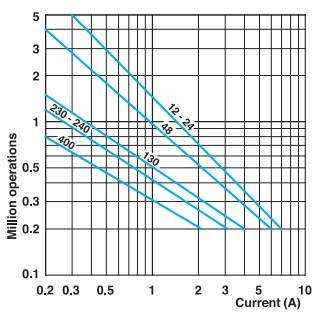
Rated insulation voltage U_i			500 V (degree of pollution 3) (400 V for contacts type Z02, X12P, X21P, W03P)
- according to IEC 60947-1 and EN 60947-1			A 600, Q 600 (A 300, Q 300 for contacts type X12P, X21P, W03P)
- according to UL 508 and CSA C22-2 n° 14			
Rated impulse withstand voltage U_{imp} (according to IEC 60947-1 and EN 60947-1)		kV	6 (4kV for contacts type X12P, X21P, W03P)
Conventional free air thermal current I_{th} (according to IEC 60947-5-1) θ < 40 °C		A	10
Short-circuit protection U_e < 500 V a.c. - gG (gl) type fuses		A	10
Rated operational current			
I_e / AC-15 (according to IEC 60947-5-1)	24 V - 50/60 Hz	A	10
	120 V - 50/60 Hz	A	6
	400 V - 50/60 Hz	A	4
I_e / DC-13 (according to IEC 60947-5-1)	24 V - d.c.	A	6
	125 V - d.c.	A	0.55
	250 V - d.c.	A	0.4
Switching frequency		Cycles/h	3600
Load factor			0.5
Resistance between contacts		mΩ	25
Connecting terminals			M3.5 (+, –) pozidriv 2 screw with cable clamp (M3 for 3 poles contacts type)
Terminal for protective conductor			–
Connecting capacity		1 or 2 x mm²	0.75 ... 2.5 (0.34... 1.5 for 3 poles contacts type)
Terminal marking			According to IEC 60947-5-1
Mechanical durability		Millions of operations	15 AP•T 10...12; 30...34; 38 / 10 DP•T 13; 41...48; 51...55; 61...75 / >5 14; 35; 36; 39; 91...93; 98 — 30 BP•H 11...13; 31...33 / 25 41...44; 51...54; 61...75 / 10 14; 19; 35...37; 91...93
Electrical durability (according to IEC 60947-5-1)			Utilization categories AC-15 and DC-13 (Load factor of 0.5 according to curves below)

* except for AP/DP•T42, T52, T5200, T55 and T5500: 25 g.

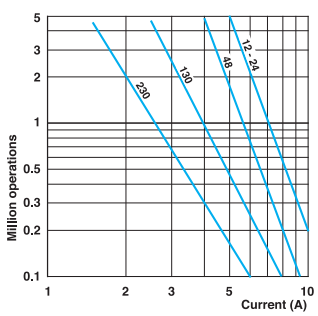
IMQ listed values

For the complete list of approved products, contact our technical department

AC-15 - Snap action



AC-15 - Slow action



DC-13		Snap action	Slow action
		Power breaking for a durability of 5 million operating cycles	
Voltage	24 V	9.5 W	12 W
Voltage	48 V	6.8 W	9 W
Voltage	110 V	3.6 W	6 W

• **Ordering details** ..... page 18 to 29, page 40 to 44

DP_T Limit Switches

Double Insulation

Plastic Casing IP65 - 50 mm. width

Electrical Connection

DP1: two cable inlets for PG 13,5 Cable Gland

DP2: two cable inlets for PG11 Cable Gland with one plastic adapter PG11 - 1/2" NPT

DP3: two cable inlets for PG11 Cable Gland

DP4: two cable inlets for M16 x 1,5 Cable Gland

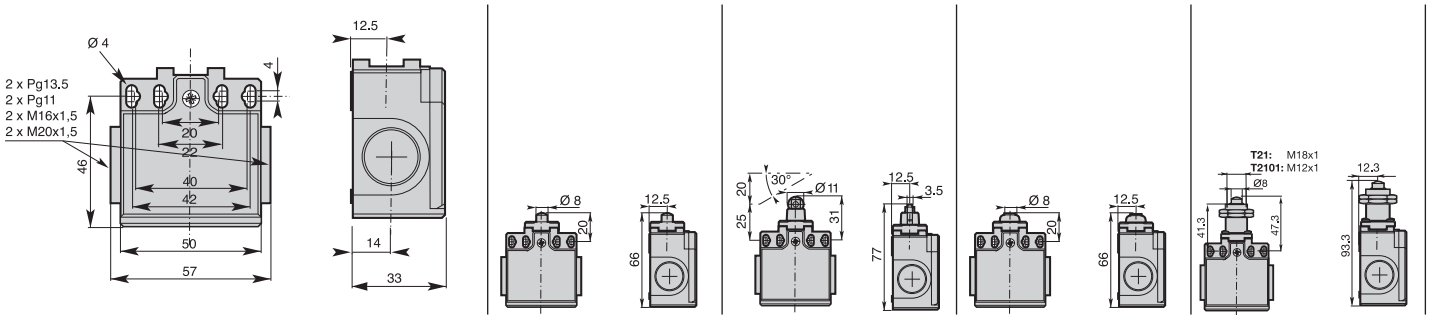
DP5: two cable inlets for M20 x 1,5 Cable Gland

Operating Head Type	T1• - Plain plunger T10: nylon plunger T11: metal plunger	T1• - Roller plunger T12: metal roller T13: nylon roller	T14 - Metal plunger with dust protection cup	T21 - Plain plunger with M18x1 fixing nuts T2101 - Plain plunger with M12x1 fixing nuts
Conformity / ⊕ (N.C. contact with positive opening operation)	⊕	⊕	⊕	⊕
Max actuation speed [m/s]	0,5	0,3	0,5	0,5
Min. force [N] or torque [Nm]: actuation / positive opening operation	15 / 30	12 / 30	15 / 30	15 / 30

Additional Technical Datas

		T1•Z11	T1•Z11	T14Z11	T21Z11
Z11 Snap Action Contacts (1NO + 1NC)	Order Code	DP•T1•Z11	DP•T1•Z11	DP•T14Z11	DP•T21Z11
	Operation Diagram	0 1.3 2.5 4.1 5.6 mm	0 2.5 4.7 7.6 9.6 mm	0 1.3 2.5 4.1 5.6 mm	0 1.3 2.5 4.1 5.6 mm
X11 Non overlapping Slow Action Contacts (1NO + 1NC)	Order Code	DP•T1•X11	DP•T1•X11	DP•T14X11	DP•T21X11
	Operation Diagram	0 1.6 3.2 5.6 mm, 2.5	0 3.2 6.0 9.6 mm, 4.6	0 1.6 3.2 5.6 mm, 2.5	0 1.6 3.2 5.6 mm, 2.5
Y11 Overlapping Slow Action Contacts (1NO + 1NC)	Order Code	DP•T1•Y11	DP•T1•Y11	DP•T14Y11	DP•T21Y11
	Operation Diagram	0 2.9 4.5 5.6 mm, 1.5	0 5.3 8.2 9.6 mm, 3.0	0 2.9 4.5 5.6 mm, 1.5	0 2.9 4.5 5.6 mm, 1.5
W02 Slow Action Contacts (2NC)	Order Code	DP•T1•W02	DP•T1•W02	DP•T14W02	DP•T21W02
	Operation Diagram	0 1.5 3.1 5.6 mm	0 3.0 5.9 9.6 mm	0 1.5 3.1 5.6 mm	0 1.5 3.1 5.6 mm
W20 Slow Action Contacts (2NO) ⊗	Order Code	DP•T1•W20	DP•T1•W20	DP•T14W20	DP•T21W20
	Operation Diagram	0 1.4 5.6 mm	0 2.8 9.6 mm	0 1.4 5.6 mm	0 1.4 5.6 mm
Z02 Snap Action Contacts (2NC)	Order Code	DP•T1•Z02	DP•T1•Z02	DP•T14Z02	DP•T21Z02
	Operation Diagram	0 1.3 2.4 4.0 5.6 mm	0 2.5 4.5 7.4 9.6 mm	0 1.3 2.4 4.0 5.6 mm	0 1.3 2.4 4.0 5.6 mm
X12P Non overlapping Slow Action Contacts (1NO + 2NC)	Order Code	DP•T1•X12P	DP•T1•X12P	DP•T14X12P	DP•T21X12P
	Operation Diagram	0 1.8 3.4 5.6 mm, 3.1	0 3.6 6.4 9.6 mm, 5.7	0 1.8 3.4 5.6 mm, 3.1	0 1.8 3.4 5.6 mm, 3.1
X21P Non overlapping Slow Action Contacts (2NO + 1NC)	Order Code	DP•T1•X21P	DP•T1•X21P	DP•T14X21P	DP•T21X21P
	Operation Diagram	0 1.8 3.4 5.6 mm, 3.1	0 3.6 6.4 9.6 mm, 5.7	0 1.8 3.4 5.6 mm, 3.1	0 1.8 3.4 5.6 mm, 3.1
W03P Slow Action Contacts (3NC)	Order Code	DP•T1•W03P	DP•T1•W03P	DP•T14W03P	DP•T21W03P
	Operation Diagram	0 1.8 3.4 5.6 mm	0 3.6 6.4 9.6 mm	0 1.8 3.4 5.6 mm	0 1.8 3.4 5.6 mm
Weight (packing per unit)	[kg]	0,100	0,105	0,100	0,110

Dimensions (in mm)



• Travel, operation diagrams and technical data ..... pages 7, 9

Utilization precautions ..... pages 14, 15

DP_T Limit Switches

Double Insulation

Plastic Casing IP65 - 50 mm. width

Electrical Connection

DP1: two cable inlets for PG 13,5 Cable Gland

DP2: two cable inlets for PG11 Cable Gland with one plastic adapter PG11 - 1/2" NPT

DP3: two cable inlets for PG11 Cable Gland

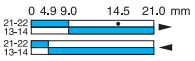
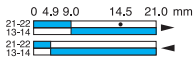
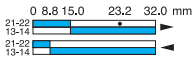
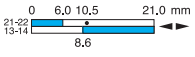
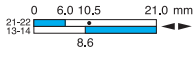
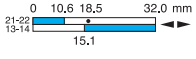
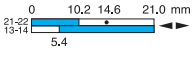
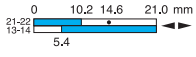
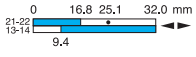
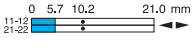
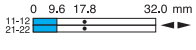
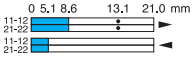
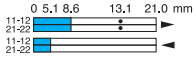
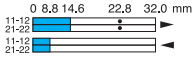
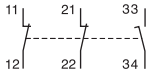
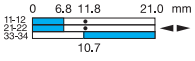
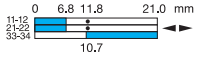
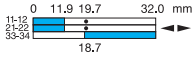
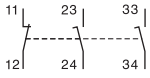
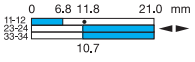
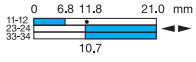
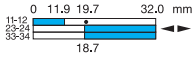
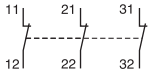
DP4: two cable inlets for M16 x 1,5 Cable Gland

DP5: two cable inlets for M20 x 1,5 Cable Gland

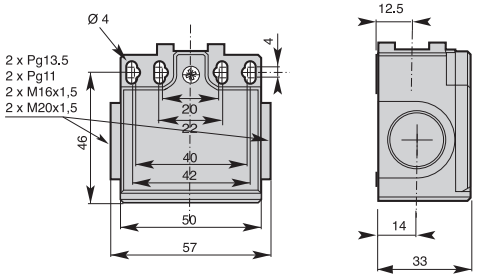
Operating Head Type

	T3• - Plastic roller lever T30: on plastic plunger T31: on metal plunger	**T35 - Plastic roller lever on metal plunger with dust protection cup**	**T38 - Adjustable plastic roller lever on metal plunger** **T39 - Same as above with dust protection cup**
Conformity / ⊖ (N.C. contact with positive opening operation)	⊖	⊖	⊖
Max actuation speed [m/s]	1,0	1,0	1,0
Min. force [N] or torque [Nm]: actuation / positive opening operation	7 / 24	7 / 24	7 / 24

Additional Technical Datas

Z11 Snap Action Contacts (1NO + 1NC)		**Order Code**	**DP•T3•Z11**	**DP•T35Z11**	**DP•T3•Z11**
		Operation Diagram			
X11 Non overlapping Slow Action Contacts (1NO + 1NC)		**Order Code**	**DP•T3•X11**	**DP•T35X11**	**DP•T3•X11**
		Operation Diagram			
Y11 Overlapping Slow Action Contacts (1NO + 1NC)		**Order Code**	**DP•T3•Y11**	**DP•T35Y11**	**DP•T3•Y11**
		Operation Diagram			
W02 Slow Action Contacts (2NC)		**Order Code**	**DP•T3•W02**	**DP•T35W02**	**DP•T3•W02**
		Operation Diagram			
W20 Slow Action Contacts (2NO)		**Codice**	**DP•T3•W20**	**DP•T35W20**	**DP•T3•W20**
		Diagramma di funzionamento			
Z02 Snap Action Contacts (2NC)		**Order Code**	**DP•T3•Z02**	**DP•T35Z02**	**DP•T3•Z02**
		Operation Diagram			
X12P Non overlapping Slow Action Contacts (1NO + 2NC)		**Order Code**	**DP•T3•X12P**	**DP•T35X12P**	**DP•T3•X12P**
		Operation Diagram			
X21P Non overlapping Slow Action Contacts (2NO + 1NC)		**Order Code**	**DP•T3•X21P**	**DP•T35X21P**	**DP•T3•X21P**
		Operation Diagram			
W03P Slow Action Contacts (3NC)		**Order Code**	**DP•T3•W03P**	**DP•T35W03P**	**DP•T3•W03P**
		Operation Diagram			
Weight (packing per unit)	**[kg]**		**0,105**	**0,105**	**0,110**

Dimensions (in mm)



• Travel, operation diagrams and technical data . . . . . pages 7, 9

Utilization precautions . . . . . pages 14, 15

DP_T Limit Switches

Double Insulation

Plastic Casing IP65 - 50 mm. width

T4• - Ø 18 roller lever
T41: nylon roller
T43: metal roller

1,5
0,10 / 0,32

T42 - Ø 50 rubber roller lever

1,5
0,10 / 0,32

T4• - Ø 18 roller lever
T45: nylon roller
T46: metal roller

1,5
0,10 / 0,32

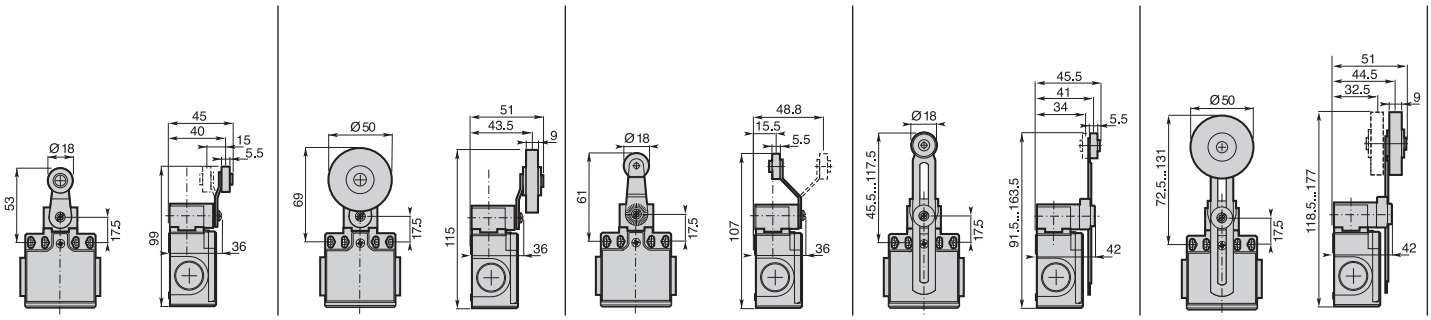
T5• - Adjustable lever with Ø 18 roller
T51: nylon roller
T53: metal roller

1,5
0,10 / 0,32

T52 - Adjustable Ø 50 rubber roller lever

1,5
0,10 / 0,32

DP•T4•Z11	**DP•T42Z11**	**DP•T4•Z11**	**DP•T5•Z11**	**DP•T52Z11**
DP•T4•X11	**DP•T42X11**	**DP•T4•X11**	**DP•T5•X11**	**DP•T52X11**
DP•T4•Y11	**DP•T42Y11**	**DP•T4•Y11**	**DP•T5•Y11**	**DP•T52Y11**
DP•T4•W02	**DP•T42W02**	**DP•T4•W02**	**DP•T5•W02**	**DP•T52W02**
DP•T4•W20	**DP•T42W20**	**DP•T4•W20**	**DP•T5•W20**	**DP•T52W20**
DP•T4•Z02	**DP•T42Z02**	**DP•T4•Z02**	**DP•T5•Z02**	**DP•T52Z02**
DP•T4•X12P	**DP•T42X12P**	**DP•T4•X12P**	**DP•T5•X12P**	**DP•T52X12P**
DP•T4•X21P	**DP•T42X21P**	**DP•T4•X21P**	**DP•T5•X21P**	**DP•T52X21P**
DP•T4•W03P	**DP•T42W03P**	**DP•T4•W03P**	**DP•T5•W03P**	**DP•T52W03P**
0,125	**0,145**	**0,125**	**0,135**	**0,155**



• Travel, operation diagrams and technical data ..... pages 7, 9

Utilization precautions ..... pages 14, 15

DP_T Limit Switches

Double Insulation

Plastic Casing IP65 - 50 mm. width

Electrical Connection

DP1: two cable inlets for PG 13,5 Cable Gland

DP2: two cable inlets for PG11 Cable Gland with one plastic adapter PG11 - 1/2" NPT

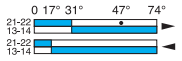
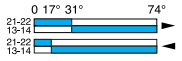
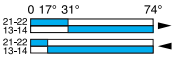
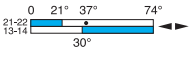
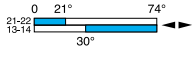
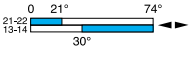
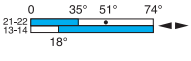
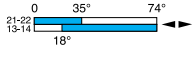
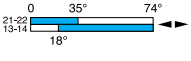
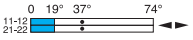
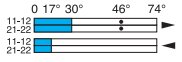
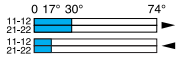
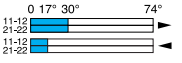
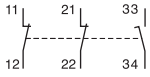
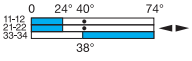
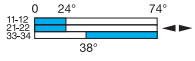
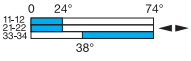
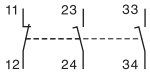
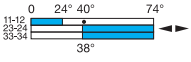
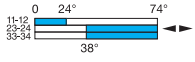
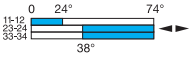
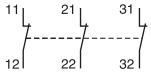
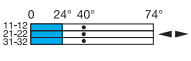
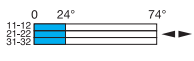
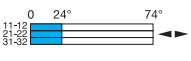
DP3: two cable inlets for PG11 Cable Gland

DP4: two cable inlets for M16 x 1,5 Cable Gland

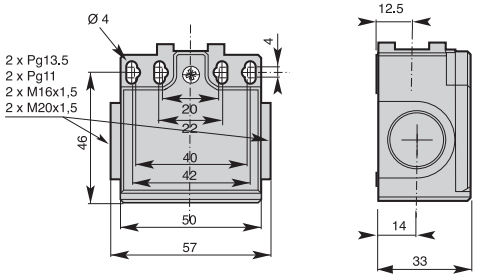
DP5: two cable inlets for M20 x 1,5 Cable Gland

Operating Head Type	T55 - Adjustable lever with adjustable Ø 50 rubber roller	T61 - Nylon actuator with stainless steel spring	T62 - Stainless steel spring actuator
Conformity / ⊕ (N.C. contact with positive opening operation)	⊕		
Max actuation speed [m/s]	1,5	1,5	1,5
Min. force [N] or torque [Nm]: actuation / positive opening operation	0,10 / 0,32	0,10 / –	0,10 / –

Additional Technical Datas

Z11 Snap Action Contacts (1NO + 1NC)		**Order Code**	**DP•T55Z11**	**DP•T61Z11**	**DP•T62Z11**
		Operation Diagram			
X11 Non overlapping Slow Action Contacts (1NO + 1NC)		**Order Code**	**DP•T55X11**	**DP•T61X11**	**DP•T62X11**
		Operation Diagram			
Y11 Overlapping Slow Action Contacts (1NO + 1NC)		**Order Code**	**DP•T55Y11**	**DP•T61Y11**	**DP•T62Y11**
		Operation Diagram			
W02 Slow Action Contacts (2NC)		**Order Code**	**DP•T55W02**	**DP•T61W02**	**DP•T62W02**
		Operation Diagram			
W20 Slow Action Contacts (2NO) ⊗		**Order Code**	**DP•T55W20**	**DP•T61W20**	**DP•T62W20**
		Operation Diagram			
Z02 Snap Action Contacts (2NC)		**Order Code**	**DP•T55Z02**	**DP•T61Z02**	**DP•T62Z02**
		Operation Diagram			
X12P Non overlapping Slow Action Contacts (1NO + 2NC)		**Order Code**	**DP•T55X12P**	**DP•T61X12P**	**DP•T62X12P**
		Operation Diagram			
X21P Non overlapping Slow Action Contacts (2NO + 1NC)		**Order Code**	**DP•T55X21P**	**DP•T61X21P**	**DP•T62X21P**
		Operation Diagram			
W03P Slow Action Contacts (3NC)		**Order Code**	**DP•T55W03P**	**DP•T61W03P**	**DP•T62W03P**
		Operation Diagram			
Weight (packing per unit)	**[kg]**		**0,155**	**0,135**	**0,135**

Dimensions (in mm)



• Travel, operation diagrams and technical data ..... pages 7, 9

Utilization precautions ..... pages 14, 15

DP_T Limit Switches

Double Insulation

Plastic Casing IP65 - 50 mm. width

T7• - Adjustable rod lever
T71: stainless steel rod Ø3
T72: fiberglass rod Ø3
T75: square steel rod 3x3

1,5
0,10 / 0,32

T7• - Adjustable Ø 6 rod lever
T73: nylon rod
T74: fiberglass rod

1,5
0,10 / 0,32

T91: Stainless steel spring multidirectional actuator

1,0
0,12 / –

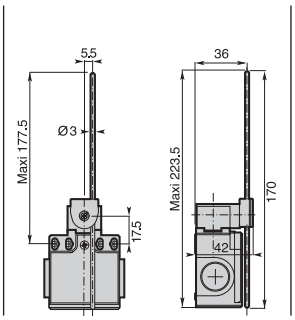
T92: Multidirectional nylon actuator with stainless steel spring

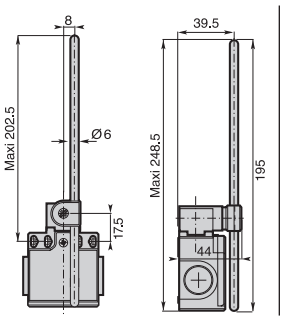
1,0
0,12 / –

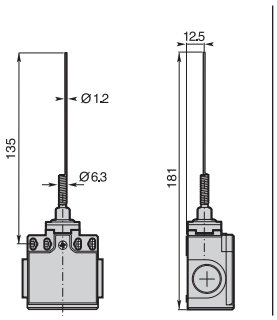
T98: Pull action with ring

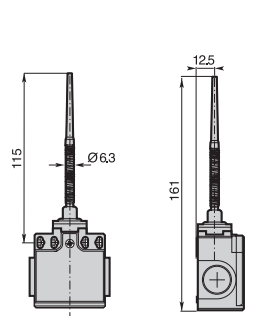
0,5
30 / –

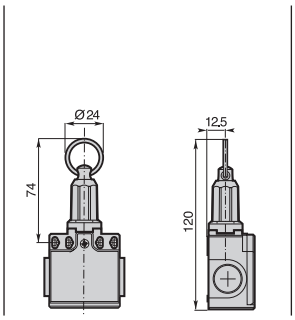
DP•T7•Z11	**DP•T7•Z11**	**DP•T91Z11**	**DP•T92Z11**	**DP•T98Z11A**
DP•T7•X11	**DP•T7•X11**	**DP•T91X11**	**DP•T92X11**	**DP•T98X11A**
DP•T7•Y11	**DP•T7•Y11**	**DP•T91Y11**	**DP•T92Y11**	**DP•T98Y11A**
DP•T7•W02	**DP•T7•W02**	**DP•T91W02**	**DP•T92W02**	**DP•T98W02A**
DP•T7•W20	**DP•T7•W20**	**DP•T91W20**	**DP•T92W20**	**DP•T98W20A**
DP•T7•Z02	**DP•T7•Z02**	**DP•T91Z02**	**DP•T92Z02**	
DP•T7•X12P	**DP•T7•X12P**	**DP•T91X12P**	**DP•T92X12P**	
DP•T7•X21P	**DP•T7•X21P**	**DP•T91X21P**	**DP•T92X21P**	
DP•T7•W03P	**DP•T7•W03P**	**DP•T91W03P**	**DP•T92W03P**	
0,130	**0,145**	**0,110**	**0,115**	**0,145**











• Travel, operation diagrams and technical data . . . . . pages 7, 9

Utilization precautions . . . . . pages 14, 15