PST-NS Series

Features

- High-precision Linear Actuator integrated with Cross Roller Guide on top of dual cylinder
- Easy stroke control by positioning forward & backward stopper function at the rear side
- Positioning holes for attachment (3 places)
- Diversity of installation (in 4 directions)
- Suitable for assembling precision work pieces
- Auto Switch for the detection of position can be attached

Order form

PST 06NS - 10 - M - A2 S - ST
① ② ③ ④ ⑤ ⑥ ⑦

① Series

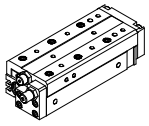
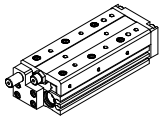
②, ③ Bore size & Stroke(mm)

②Name	Bore size(mm)	③Stroke(mm)
06NS	6	5,10,20,30,40,50
08NS	8	10,20,30,40,50,75
12NS	12	10,20,30,40,50,75,100
16NS	16	10,20,30,40,50,75,100,125
20NS	20	10,20,30,40,50,75,100,125,150
25NS	25	10,20,30,40,50,75,100,125,150

⑤ Auto Switch type

Symbol	Type	Length	Applied cylinder
A1	DSC PRO-A1 (2-wire)	1m	PST20NS 25NS
A1L		3m	
B1	PLC PRO-B1 (3-wire)	1m	
B1L		3m	
A2	DSC PRO-A2 (2-wire)	1m	PST06NS 08NS 12NS 16NS
A2L		3m	
B2	PLC PRO-B2 (3-wire)	1m	
B2L		3m	

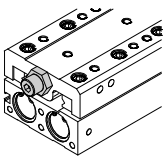
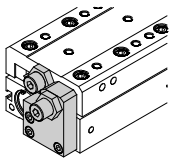
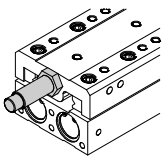
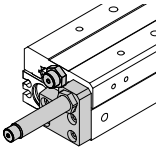
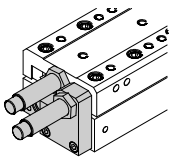
④ Symmetrical specification

Blank	M
Standard type	Symmetrical
	

⑥ Auto Switch quantity

Blank	2ea
S	1ea

⑦ Stroke adjusting stopper specification

Blank	ST	SHF	SHB	SH2
Forward Stopper (Urethane cushion)	Back & forward Stopper (Urethane cushion)	Forward Shock Absorber	Backward Shock Absorber	Back & forward Shock Absorber
				

※Please refer P272~P273 for checking Shock absorber and backward stopper installation.

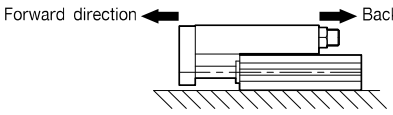
Specification

Model		PST06NS	PST08NS	PST12NS	PST16NS	PST20NS	PST25NS
Bore size(mm)		6	8	12	16	20	25
Rod(mm)		3	4	6	8	10	12
Stroke(mm)		5 ~ 50	10 ~ 75	10 ~ 100	10 ~ 125	10 ~ 150	10 ~ 150
Theoretical thrust(kgf)	Forward	0.57×P	1.1×P	2.26×P	4.02×P	6.28×P	9.82×P
Note 2)	Backward	0.42×P	0.75×P	1.70×P	3.02×P	4.71×P	7.56×P
Air port size		M3	M5	M5	M5	M5	M5
Max. load(kgf)		0.6	1	2.4	4.3	6.7	10.7
Fluid		Clean air Note 1)					
Air pressure(kgf/㎠)		1.5 ~ 7 (General resistance pressure: 10.5) Note 3)					
Lubrication		No need (if need, use one sort of turbine oil: SPEC ISOVG 32)					
Temperature(℃)		5 ~ 60					
Motion speed(mm/sec)		50 ~ 500					
Motion type		Double-acting type					
Positioning Accuracy(mm)		± 0.01					
Stroke allowable tolerance in forward(mm)		0 ~ +1					

Note 1) Clean air: Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3~10㎛ degree of filtering
Note 2) P: Air pressure(kgf/㎠)
Note 3) Guaranteed capacity of resist pressure: A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Main body weight

Model \ Stroke(mm)	5	10	20	30	40	50	75	100	125	150
PST06NS	0.07	0.08	0.11	0.12	0.17	0.19	-	-	-	-
PST08NS	-	0.16	0.17	0.2	0.25	0.3	0.43	-	-	-
PST12NS	-	0.32	0.32	0.32	0.39	0.49	0.69	0.92	-	-
PST16NS	-	0.58	0.58	0.58	0.66	0.8	1.15	1.45	1.8	-
PST20NS	-	0.99	0.99	0.99	1.15	1.29	1.7	2.24	2.79	3.35
PST25NS	-	1.71	1.71	1.71	1.9	2.15	2.75	3.39	4.28	4.89



Unit : kgf

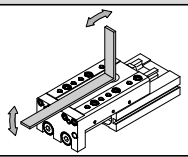
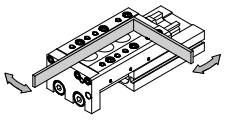
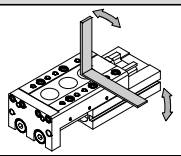
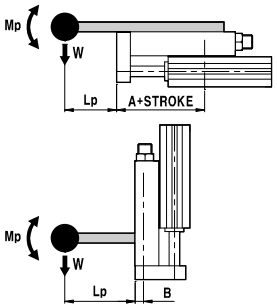
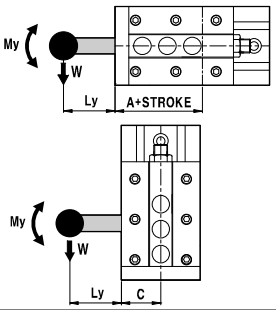
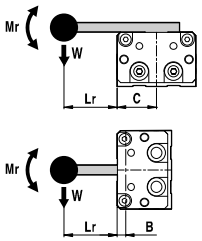
Theoretical thrust

Model	Operation direction (refer to the figure)	Pressuring dimension (㎠)	Air pressure(kgf/㎠)					
			2	3	4	5	6	7
PST06NS	Forward	57	1.14	1.71	2.28	2.85	3.42	3.99
	Backward	42	0.84	1.26	1.68	2.1	2.52	2.94
PST08NS	Forward	110	2.2	3.3	4.4	5.5	6.6	7.7
	Backward	75	1.5	2.25	3	3.75	4.5	5.25
PST12NS	Forward	226	4.52	6.78	9.04	11.3	13.5	15.8
	Backward	170	3.4	5.1	6.8	8.5	10.2	11.9
PST16NS	Forward	402	8.04	12	16	20.1	24.1	28.1
	Backward	302	6.04	9.06	12	15.1	18.1	21.1
PST20NS	Forward	628	12.5	18.8	25.1	31.4	37.6	43.9
	Backward	471	9.42	14.1	18.8	23.5	28.2	32.9
PST25NS	Forward	982	19.6	29.4	39.2	49.1	58.9	68.7
	Backward	756	15.1	22.6	30.2	37.8	45.3	52.9

Technical data by model

■ Mp, My, Mr 3 directions moment calculation formula

Fig1

Pitch Moment(Mp)	Yawing Moment(My)	Rolling Moment(Mr)
		
		
Mp = W × (A + STROKE + Lp) Mp = W × (B + Lp)	My = W × (A + STROKE + Ly) My = W × (C + Ly)	Mr = W × (C + Lr) Mr = W × (B + Lr)

※ W : Work weight(kgf)

■ Corrections from the central distance of moments Table1

Unit : mm

Model \ Corrections / Stroke	A										B	C
	5	10	20	30	40	50	75	100	125	150		
PST06NS	22	19	19	19	25	28	-	-	-	-	6	16
PST08NS	-	23	21	21	26	30	42	-	-	-	8.5	20
PST12NS	-	36	31	26	27	32	42	57	-	-	9.5	23
PST16NS	-	39	34	29	29	32	44	56	68	-	13.5	28
PST20NS	-	44	39	34	34	37	44	57	72	86	17.5	34
PST25NS	-	50	45	40	40	42	50	58	74	82	21.5	41

■ Maximum allowable moment Table2

Unit : kgf · ㎝

Model \ Stroke		5	10	20	30	40	50	75	100	125	150
PST06NS	Mp	2.39	2.39	3.58	3.58	5.38	5.97	-	-	-	-
	My	2.39	2.39	3.58	3.58	5.38	5.97	-	-	-	-
	Mr	5.04	5.04	7.06	7.06	10	11.09	-	-	-	-
PST08NS	Mp	-	3.58	3.58	4.18	4.78	6.57	8.96	-	-	-
	My	-	3.58	3.58	4.18	4.78	6.57	8.96	-	-	-
	Mr	-	8.73	8.73	9.98	11.2	14.9	19.9	-	-	-
PST12NS	Mp	-	10.9	10.9	10.9	12.7	16.3	23.6	27.3	-	-
	My	-	10.9	10.9	10.9	12.7	16.3	23.6	27.3	-	-
	Mr	-	26.3	26.3	26.3	30.1	37.6	52.7	60.2	-	-
PST16NS	Mp	-	14.5	14.5	14.5	14.5	16.3	23.6	32.7	40	-
	My	-	14.5	14.5	14.5	14.5	16.3	23.6	32.7	40	-
	Mr	-	42.7	42.7	42.7	42.7	47.5	66.5	90.2	109	-
PST20NS	Mp	-	33.2	33.2	33.2	33.2	39.8	53.1	79.7	86.4	93
	My	-	33.2	33.2	33.2	33.2	39.8	53.1	79.7	86.4	93
	Mr	-	93.3	93.3	93.3	93.3	108.9	140	202	217	233
PST25NS	Mp	-	59.6	59.6	59.6	74.5	89.4	104	134	178	208
	My	-	59.6	59.6	59.6	74.5	89.4	104	134	178	208
	Mr	-	173	173	173	208	242	277	346	450	520

■ Maximum allowable kinetic energy (Ea) Table3 Unit : kgf · cm

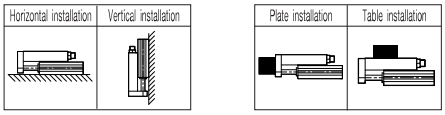
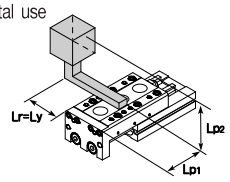
Model \ Allowable kinetic energy	Stopper type	
	Urethane cushion	Shock Absorber
PST06NS	0.12	-
PST08NS	0.19	0.5
PST12NS	0.63	0.9
PST16NS	1.2	1.8
PST20NS	1.8	3.4
PST25NS	2.2	4.7

■ Maximum allowable load (Wa) Table4 Unit : kgf

Model	Max. load
PST06NS	0.6
PST08NS	1
PST12NS	2.4
PST16NS	4.3
PST20NS	6.7
PST25NS	10.7

※For vertical installation, load check is not required.

Model selection method

		Applied formula	Selection example
Condition check		■Cylinder Model selection ■Average speed ■Cushion type (urethane/absorber) ■Loaded Weight ■Distance to the center of gravity in load ■Block installation ■Load installation 	Review target: PST12NS-50 Table installation, horizontal use Urethane cushion Average speed: V=300mm/sec Loading factor W=0.5kgf Lp_1 = 30mm Lp_2 = 40mm Ly, Lr = 20mm 
Kinetic energy check - The kinetic energy of load should be within the allowable kinetic energy range of cylinder.		Work kinetic energy(kgf · cm) : $E = K_1 \times \frac{1}{2} \times \frac{W}{980} \times (\frac{1.4V}{10})^2$ W : work weight(kgf) V : average speed(mm/sec) K_1 : installation factor(Table installation: 1, Plate installation: 1.6) Ea : cylinder allowable kinetic energy(kgf · cm) Table3 Applicable only if E < Ea	$E = 1 \times \frac{1}{2} \times \frac{0.5}{980} \times (\frac{1.4 \cdot 300}{10})^2 = 0.45$ kgf · cm Ea = 0.63 kgf · cm Available as E(0.45) < Ea(0.63)
Load factor check - Loading factor - Static moment load factor - Dynamic moment load factor - Total sum of load factors should not exceed	Loading factor	Suitable loading factor(kgf) : $Wt = K_1 \times K_2 \times W$ θ_1 : Loading factor = $\frac{Wt}{Wa}$ W : work Weight(kgf) K_1 : installation factor(Table installation: 1, Plate installation: 1.6) K_2 : speed factor(300mm/sec or less: over 1, 300mm/sec: 1.6) Wa : cylinder Max. load(kgf) Table4	$Wt = 1 \times 1 \times 0.5 = 0.5$ kgf Wa = 2.4 kgf $\theta_1 = \frac{0.5}{2.4} = 0.21$
	Static moment	Pitching moment(kgf · cm) : Mp = W×(A+Stroke+Lp1) / 10 Rolling moment(kgf · cm) : Mr = W×(C+Lr) / 10 θ_2 : pitching Static moment load factor = $\frac{Mp}{Mpa}$ θ_3 : rolling Static moment load factor = $\frac{Mr}{Mra}$ A.C : corrections from the center distance of moments(mm) Table1 Lp, Lr : distance from the end of table to the center of load(mm) Fig1 Mpa, Mra : cylinder allowable moment(kgf · cm) Table2	$Mp = 0.5 \times \frac{(32+50-30)}{10} = 2.6$ kgf · cm $\theta_2 = \frac{2.6}{16.3} = 0.16$ $Mr = 0.5 \times \frac{(23+20)}{10} = 2.15$ kgf · cm $\theta_3 = \frac{2.15}{37.6} = 0.06$
	Dynamic moment	Pitching moment(kgf · cm) : Mp = $K_2 \times K_3 \times W \times (B+Lp2)$ / 10 yawing moment(kgf · cm) : My = $K_2 \times K_3 \times W \times (C+Ly)$ / 10 θ_4 : pitching dynamic moment load factor = $\frac{Mp}{Mpa}$ θ_5 : yawing dynamic moment load factor = $\frac{My}{Mya}$ K_2 : speed factor(300mm/sec or less: over 1,300mm/sec: 1.6) K_3 : duty factor(Urethane stopper: 1, shock absorber: 0.25) B.C: corrections from the center distance of moments(mm) Table1 Lp, Ly : distance from the end of table to the center of load(mm) Fig1 Mpa, Mya : cylinder allowable moment(kgf · cm) Table2	$Mp = 1 \times 1 \times 0.5 \times \frac{(9.5+40)}{10} = 2.5$ kgf · cm $\theta_4 = \frac{2.5}{16.3} = 0.16$ $My = 1 \times 1 \times 0.5 \times \frac{(23+20)}{10} = 2.15$ kgf · cm $\theta_5 = \frac{2.15}{16.3} = 0.13$
Total load factor		$\theta t = \theta_1 + \theta_2 + \theta_3 + \theta_4 + \theta_5 \leqq 1$	$\theta t = 0.21 + 0.16 + 0.06 + 0.16 + 0.13 = 0.72 \leqq 1$ PST12NS-50 is applicable

Note1) Static moment load factor: moment created by the gravity of work Dynamic moment load factor: moment created when the work is stopped by stopper

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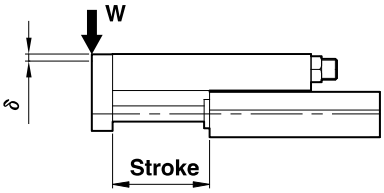
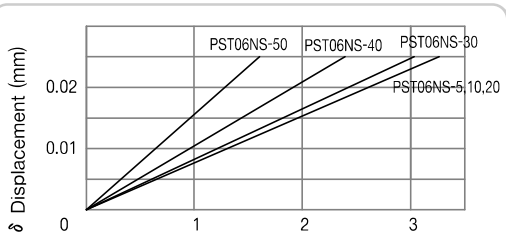
Table deflection

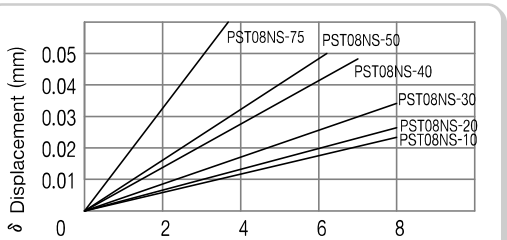
- The graph represents the deflection if any static load is applied at the end of table when moved forward as much as the corresponding stroke.
- The deflections below mentioned are only for a reference. (Please note that they are NOT maximum value).



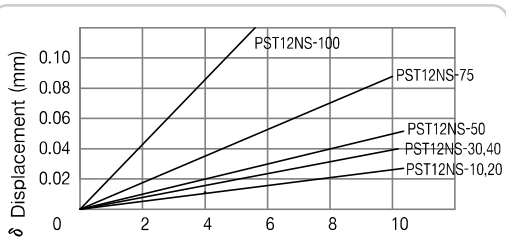
◆ PST06NS



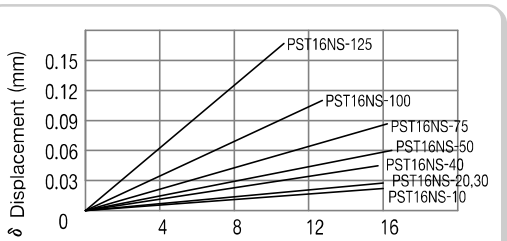
◆ PST08NS



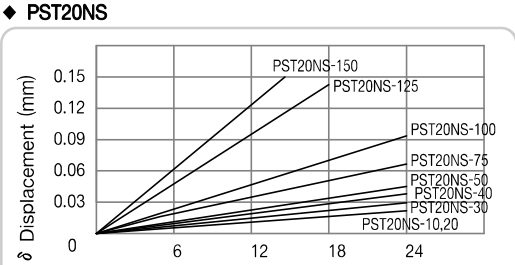
◆ PST12NS



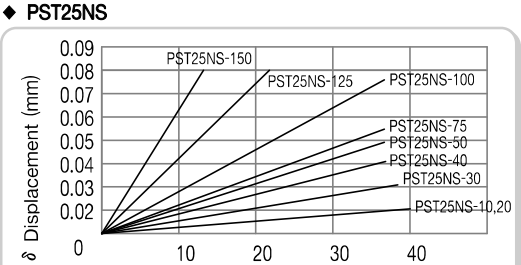
◆ PST16NS



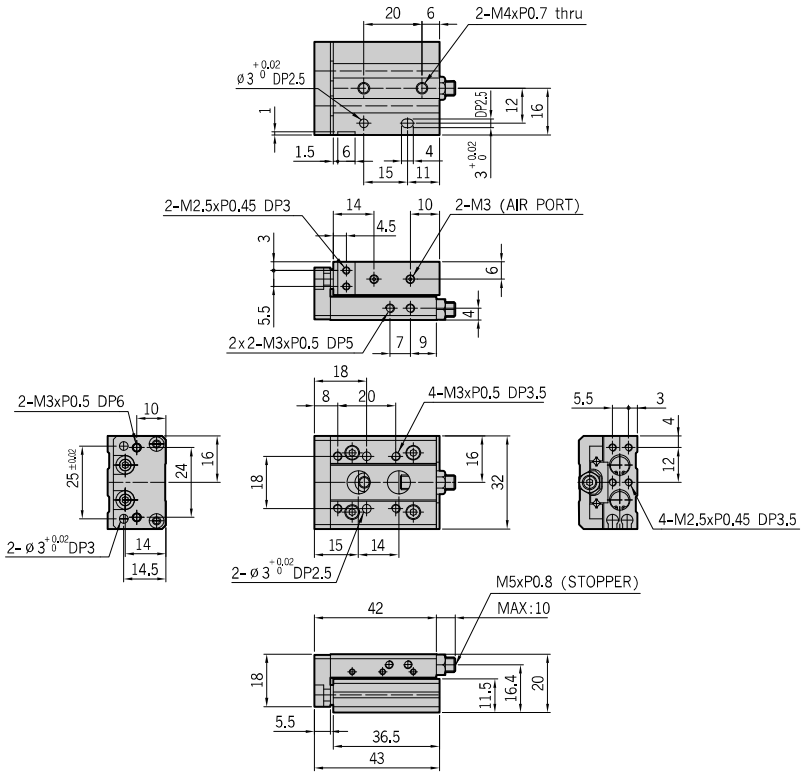
◆ PST20NS



◆ PST25NS

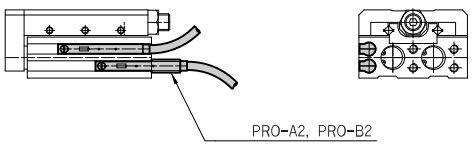


PST06NS-05



※Only bottom TAP(M4) available for body installation

PST06NS-05-Auto Switch



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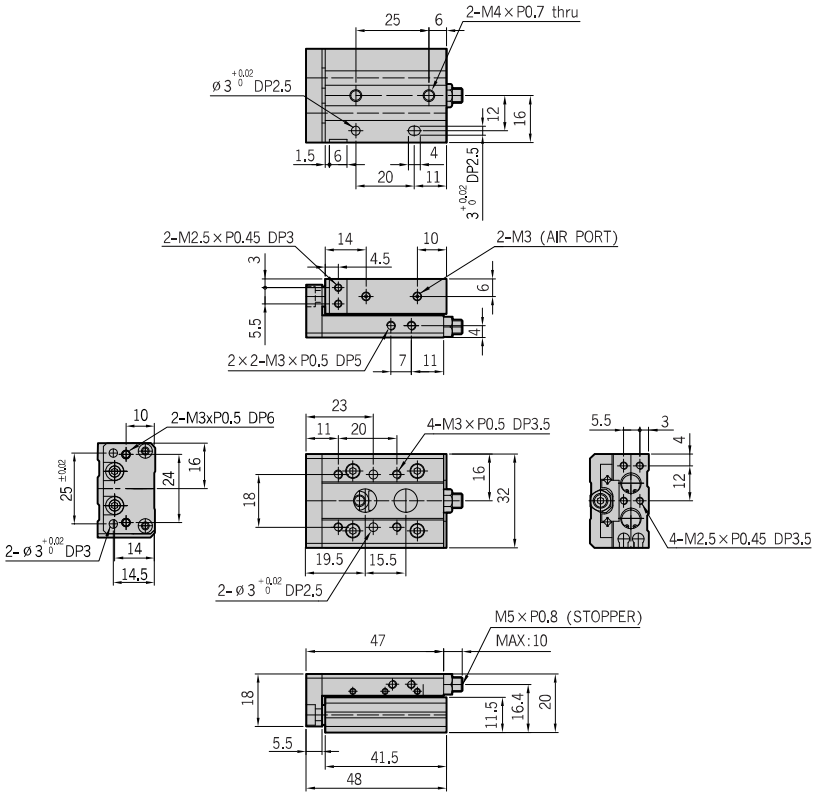
06NS | 08NS | 12NS | 16NS | 20NS | 25NS

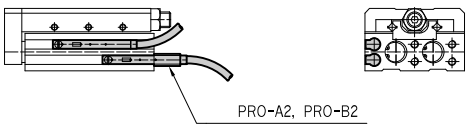
05 | **10** | 20 | 30 | 40 | 50

PST06NS-10

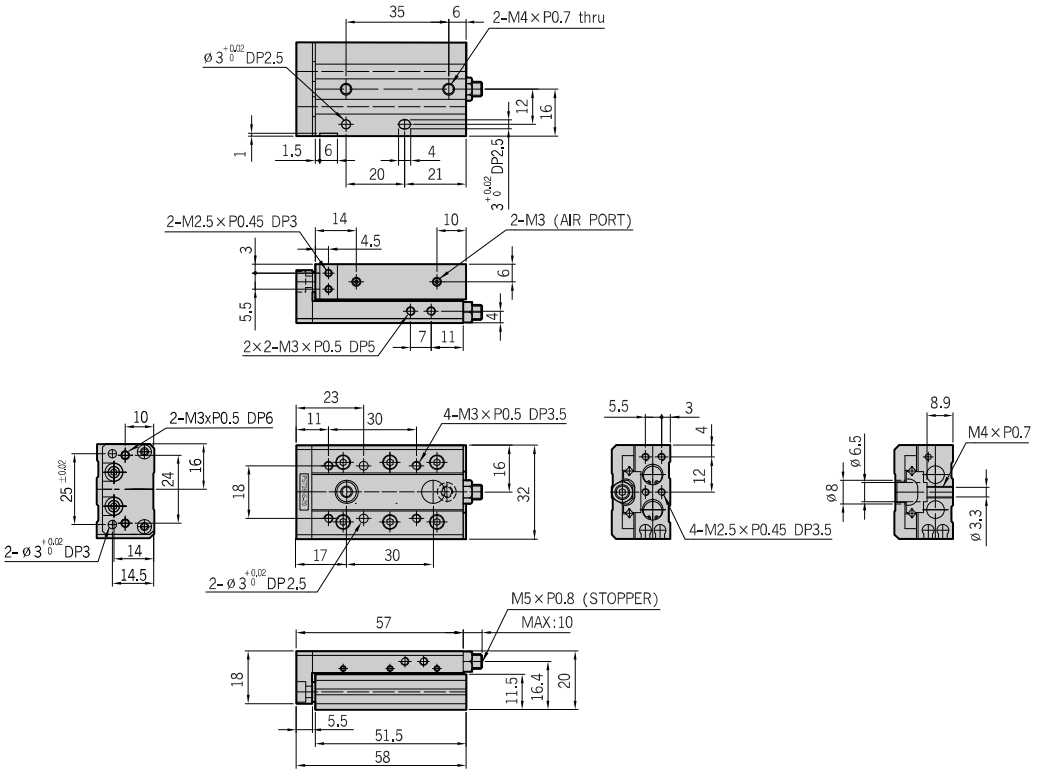


※Only bottom TAP(M4) available for body installation

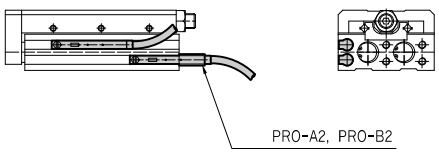
PST06NS-10-Auto Switch



PST06NS-20



PST06NS-20-Auto Switch

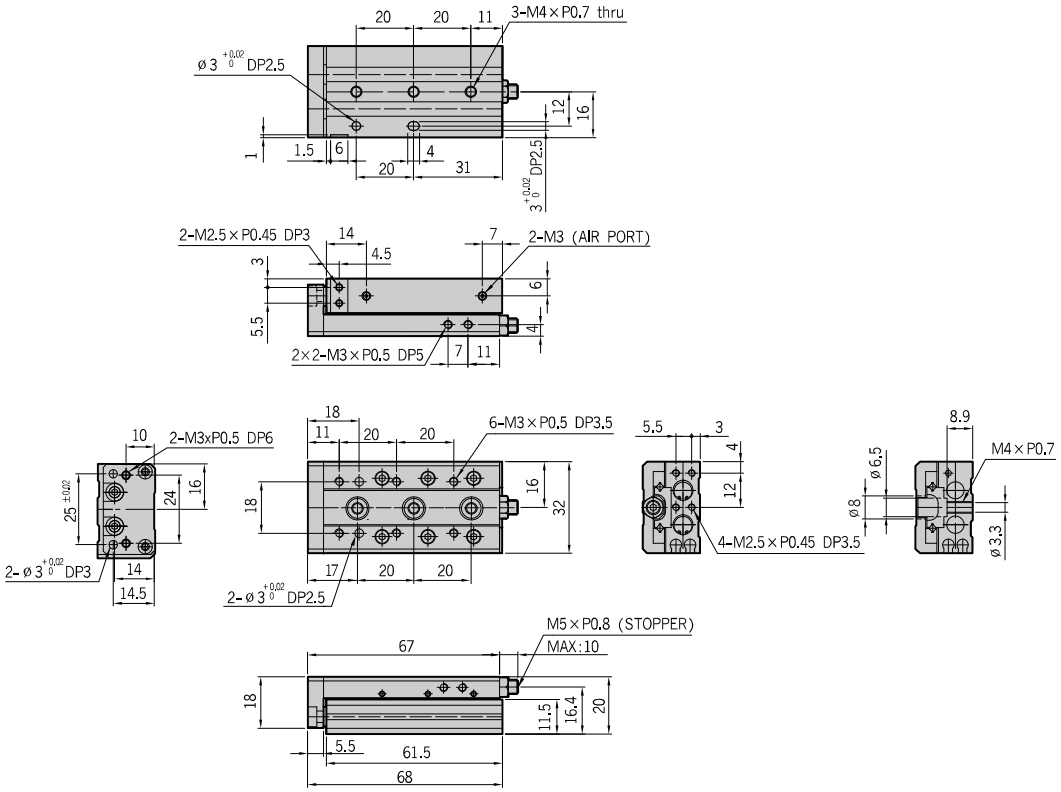


PST-NS Series

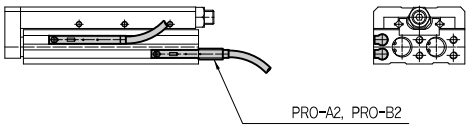
06NS | 08NS | 12NS | 16NS | 20NS | 25NS

05 | 10 | 20 | **30** | 40 | 50

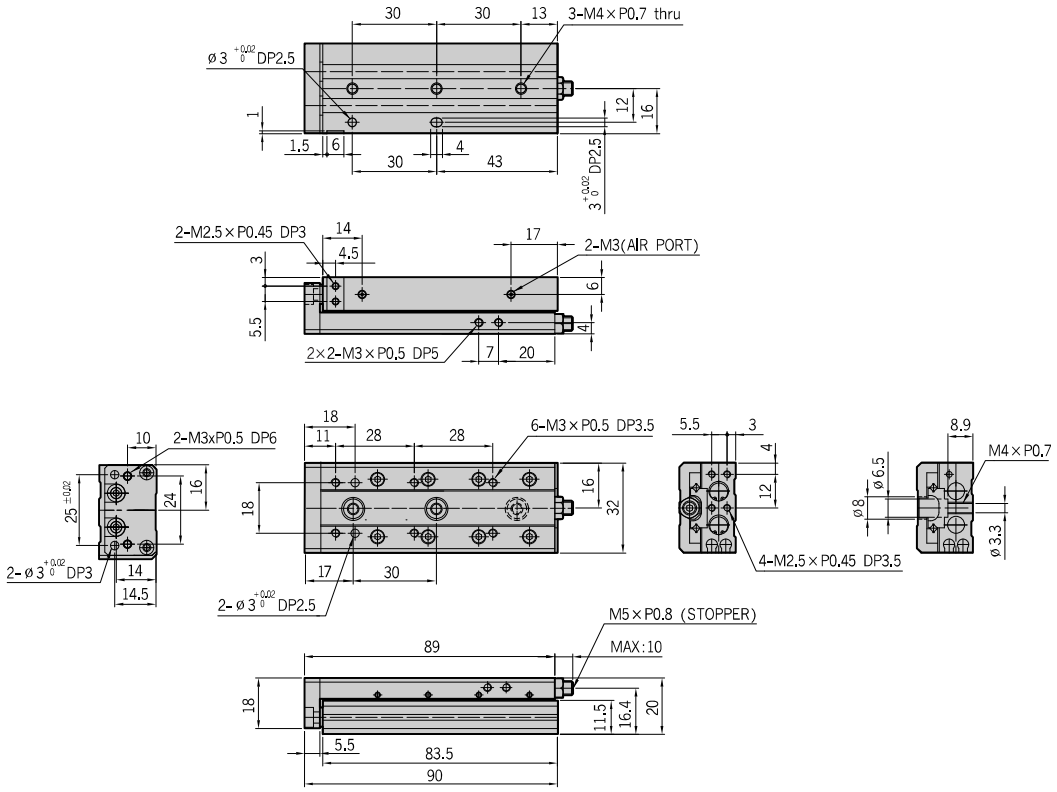
PST06NS-30



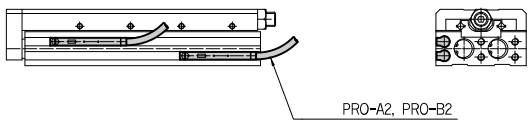
PST06NS-30-Auto Switch



PST06NS-40



PST06NS-40-Auto Switch

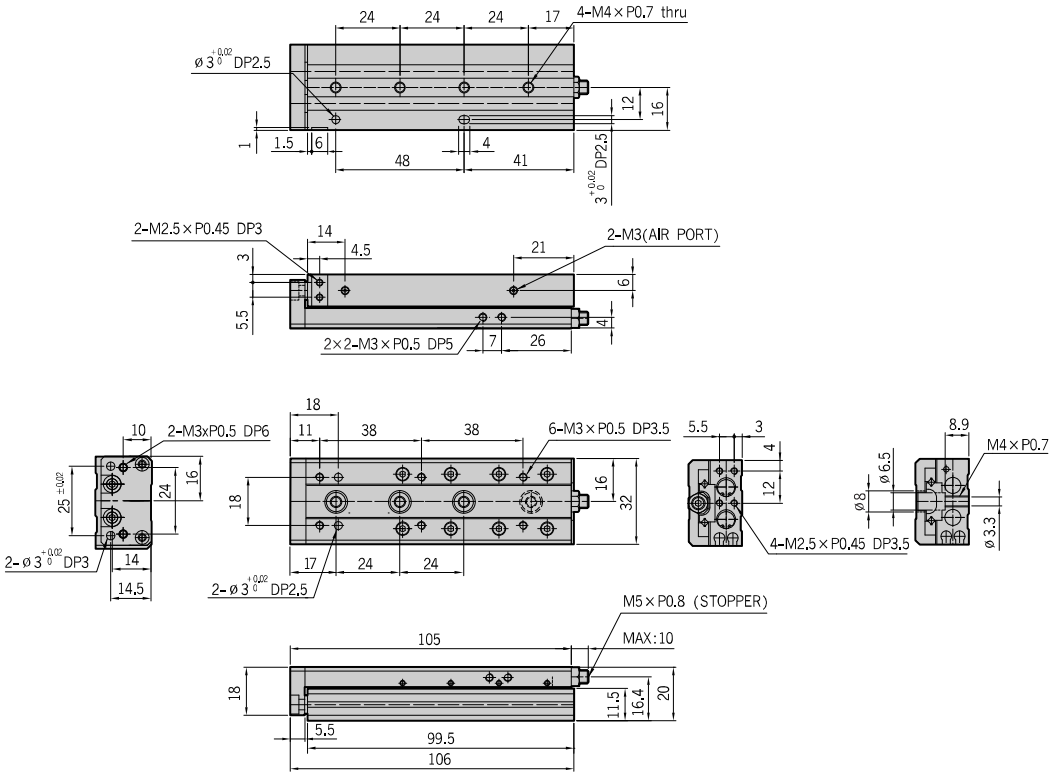


PST-NS Series

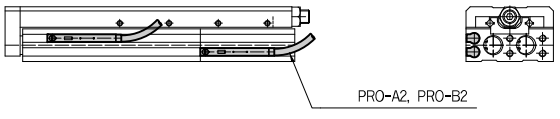
06NS | 08NS | 12NS | 16NS | 20NS | 25NS

05 | 10 | 20 | 30 | 40 | 50

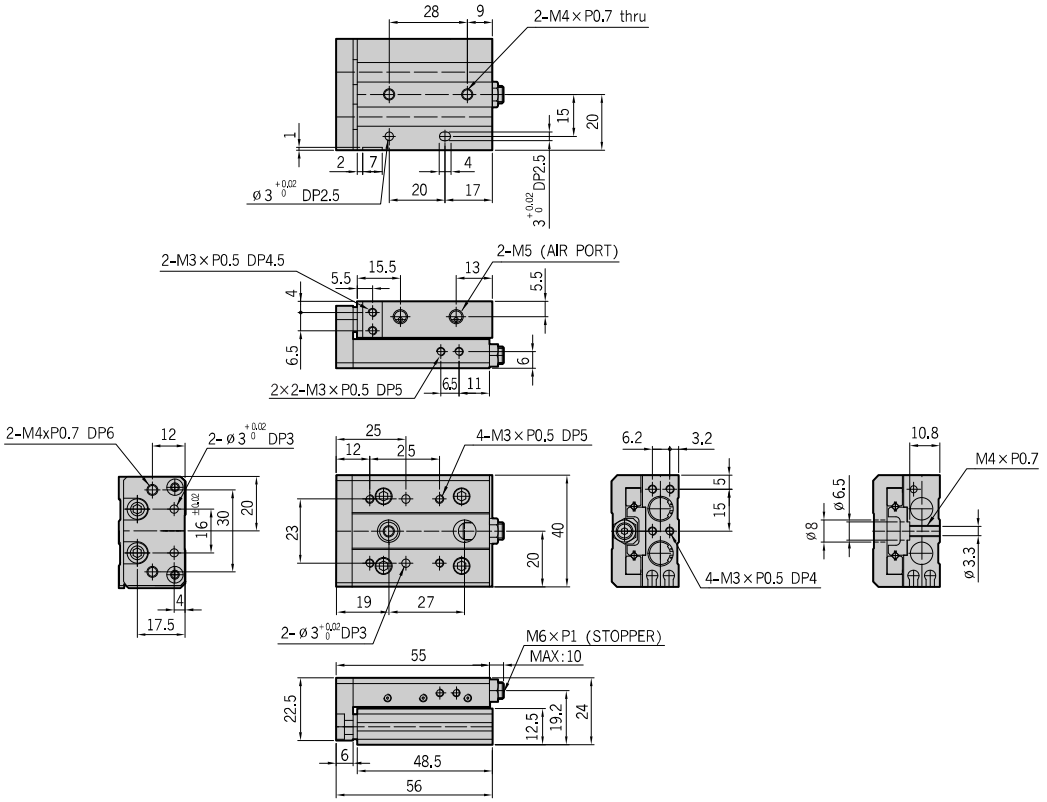
PST06NS-50



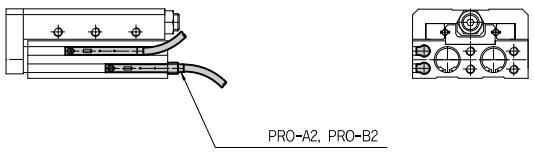
PST06NS-50-Auto Switch



PST08NS-10



PST08NS-10-Auto Switch

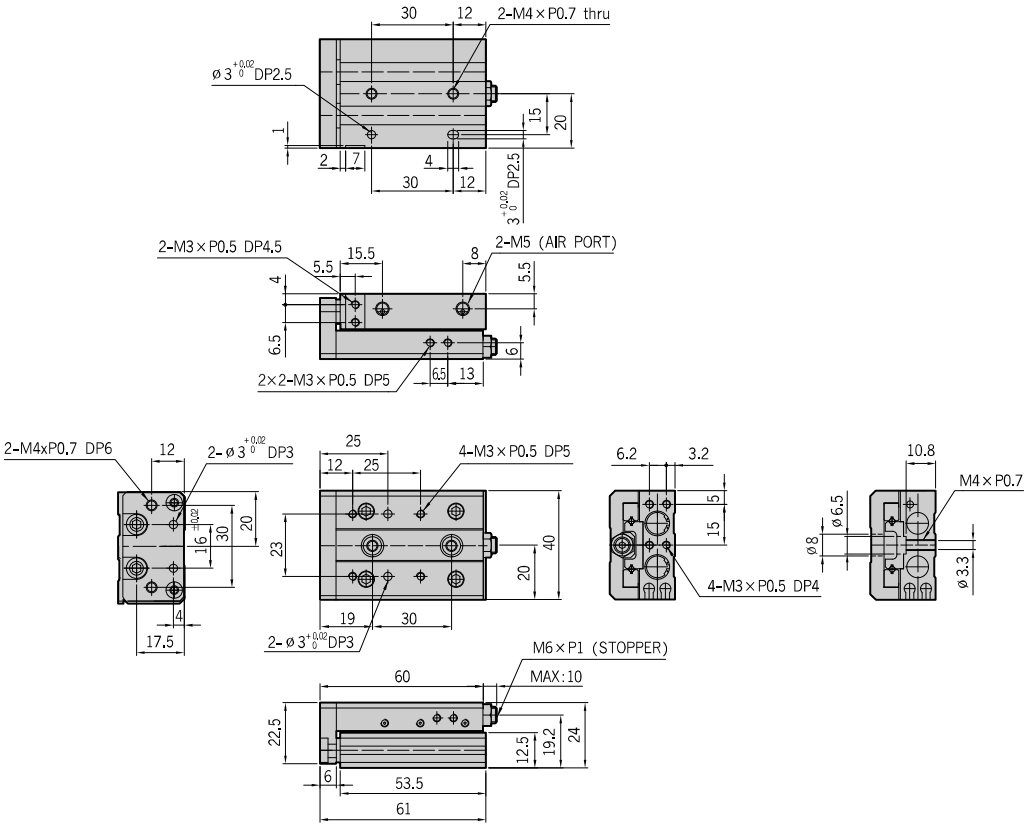


PST-NS Series

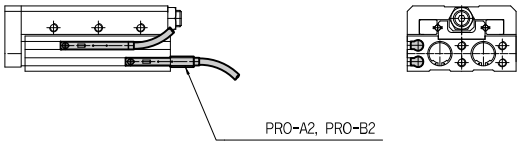
06NS | **08NS** | 12NS | 16NS | 20NS | 25NS

10 | **20** | 30 | 40 | 50 | 75

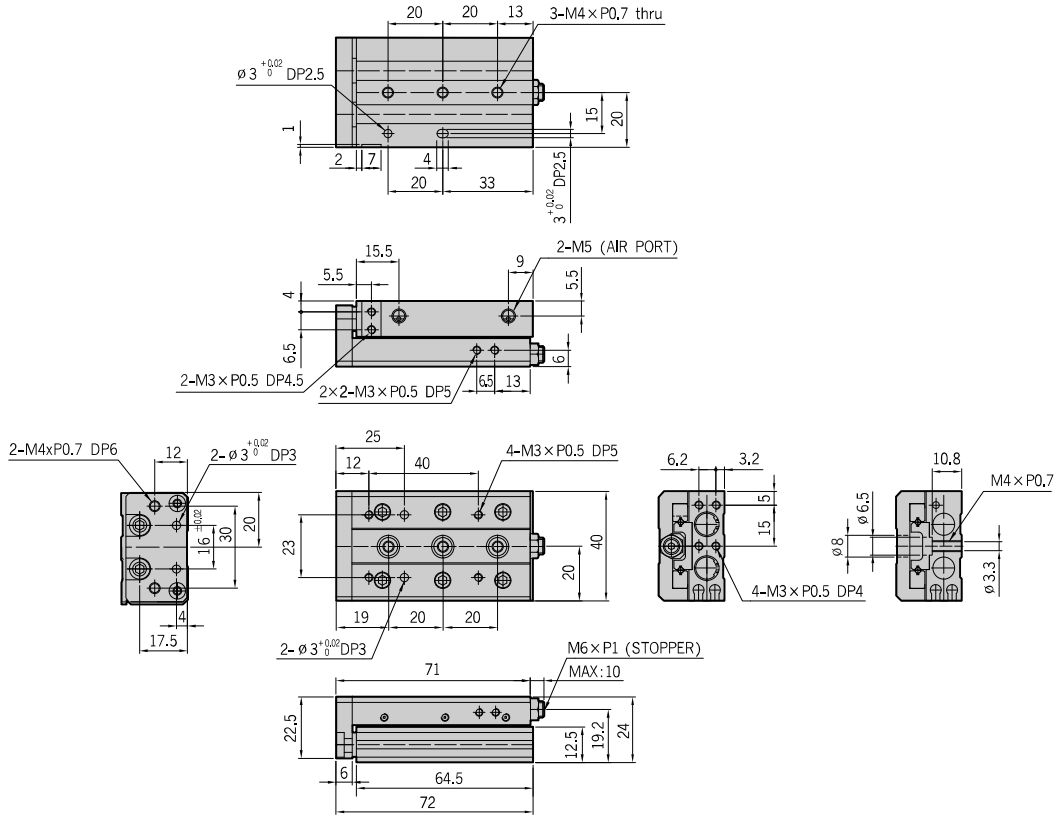
PST08NS-20



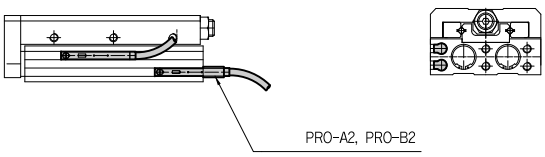
PST08NS-20-Auto Switch



PST08NS-30



PST08NS-30-Auto Switch

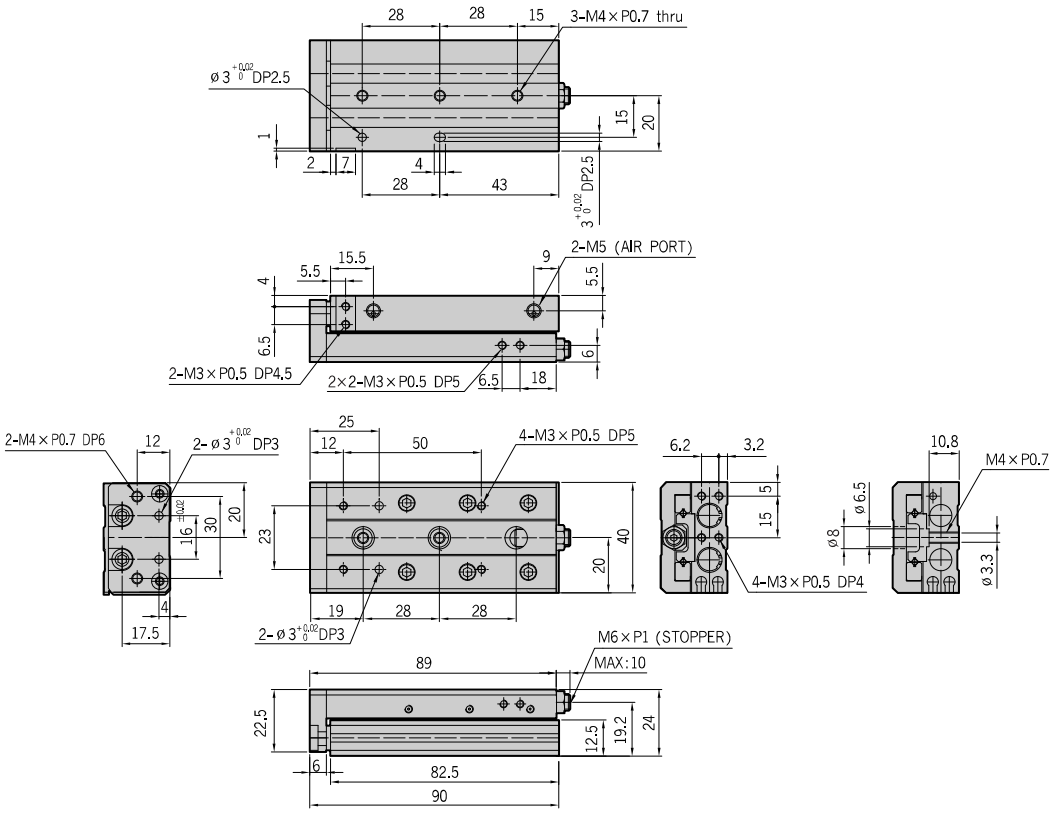


PST-NS Series

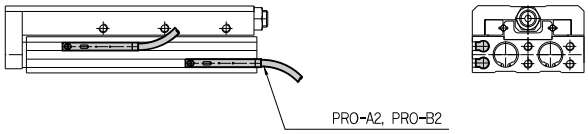
06NS | **08NS** | 12NS | 16NS | 20NS | 25NS

10 | 20 | 30 | **40** | 50 | 75

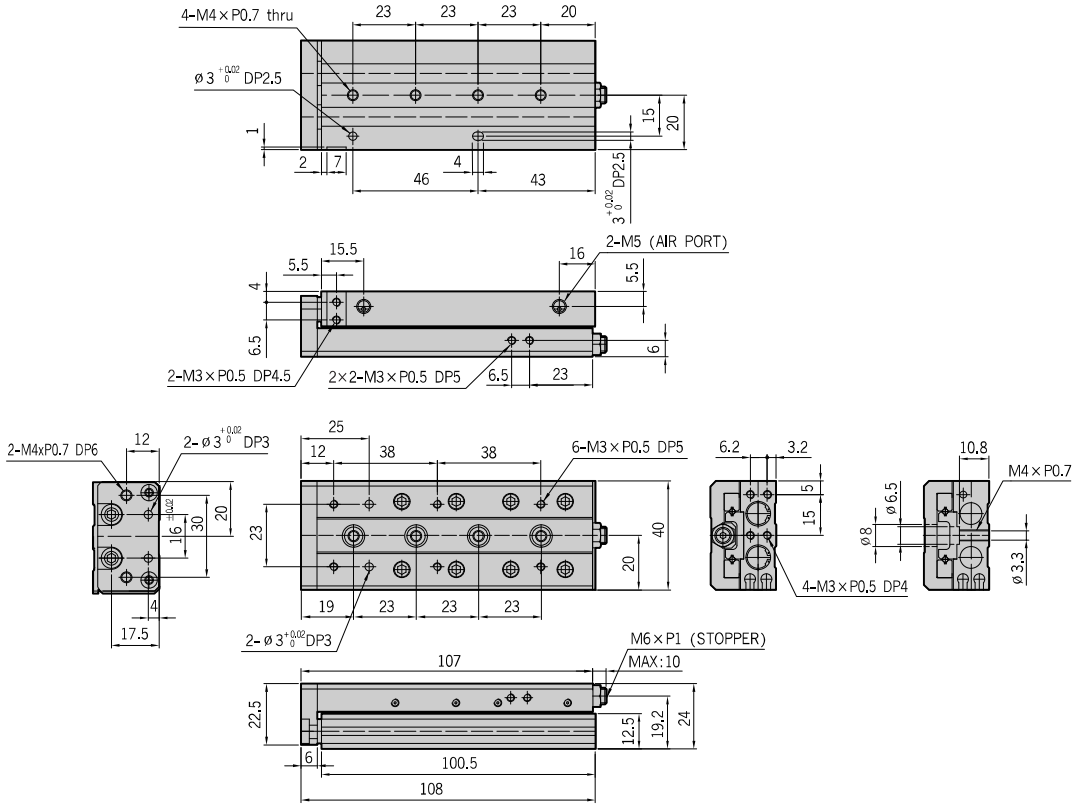
PST08NS-40



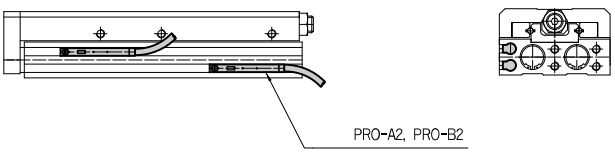
PST08NS-40-Auto Switch



PST08NS-50



PST08NS-50-Auto Switch

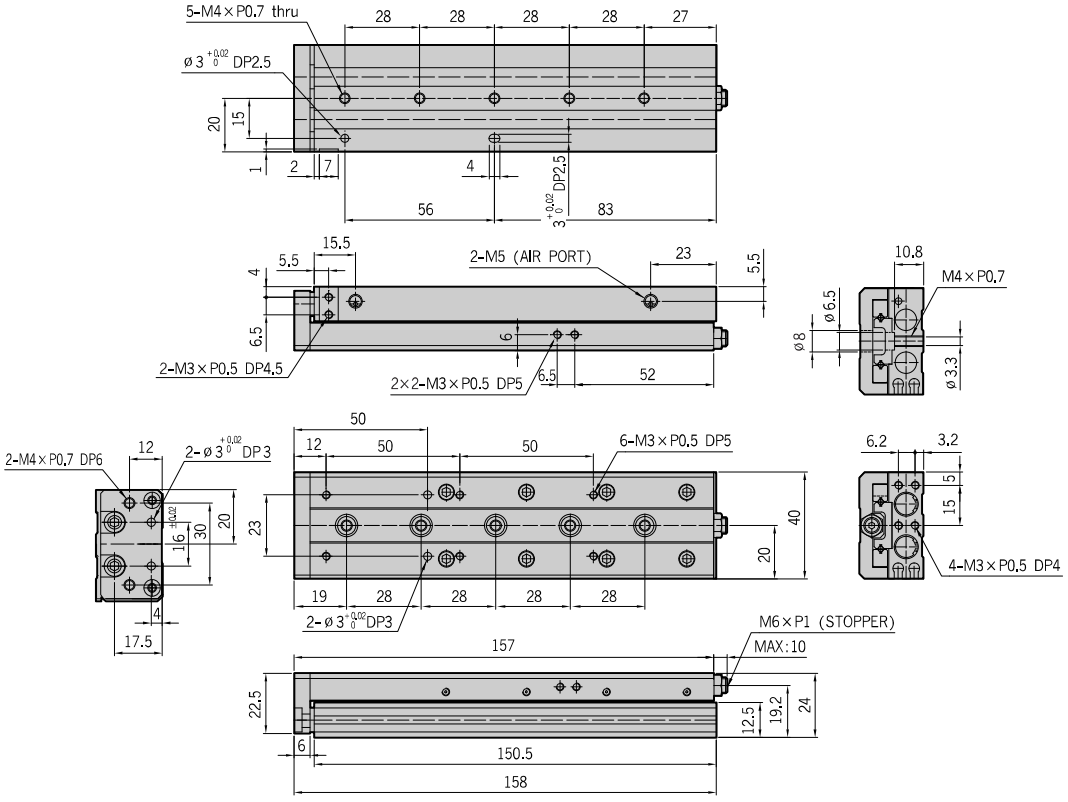


PST-NS Series

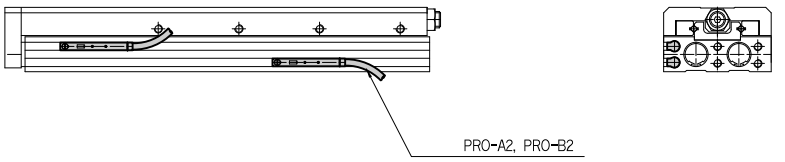
06NS | 08NS | 12NS | 16NS | 20NS | 25NS

10 | 20 | 30 | 40 | 50 | 75

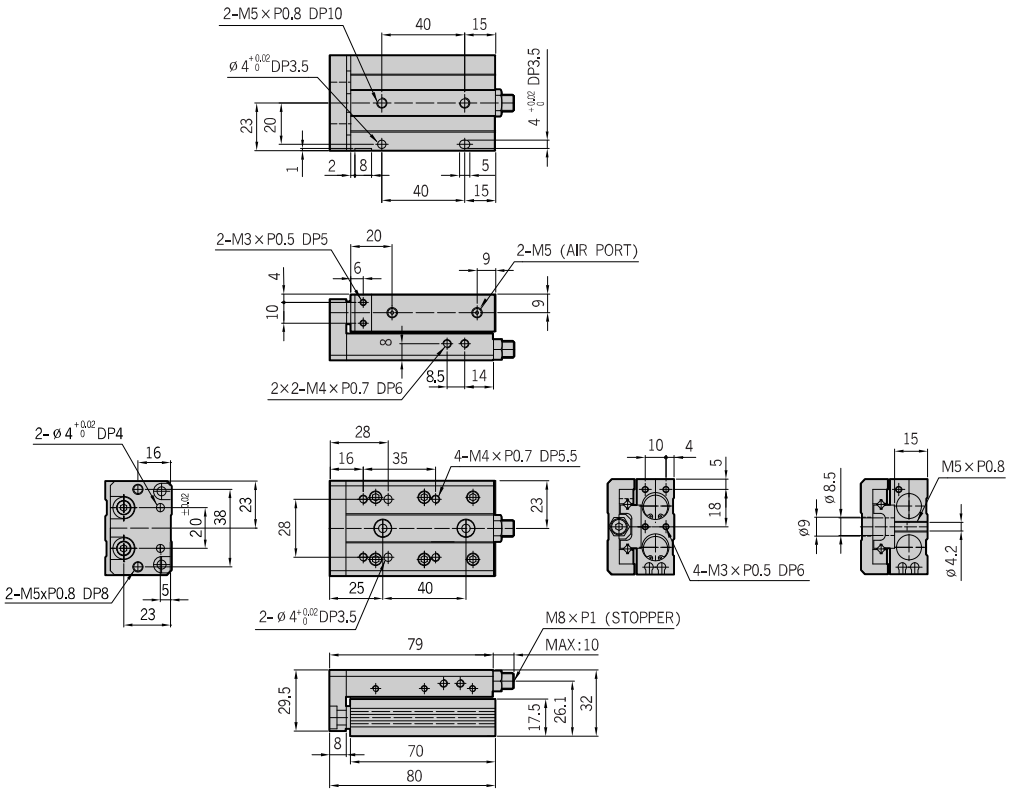
PST08NS-75



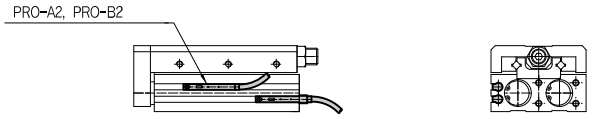
PST08NS-75-Auto Switch



PST12NS-10,20,30



PST12NS-10,20,30-Auto Switch

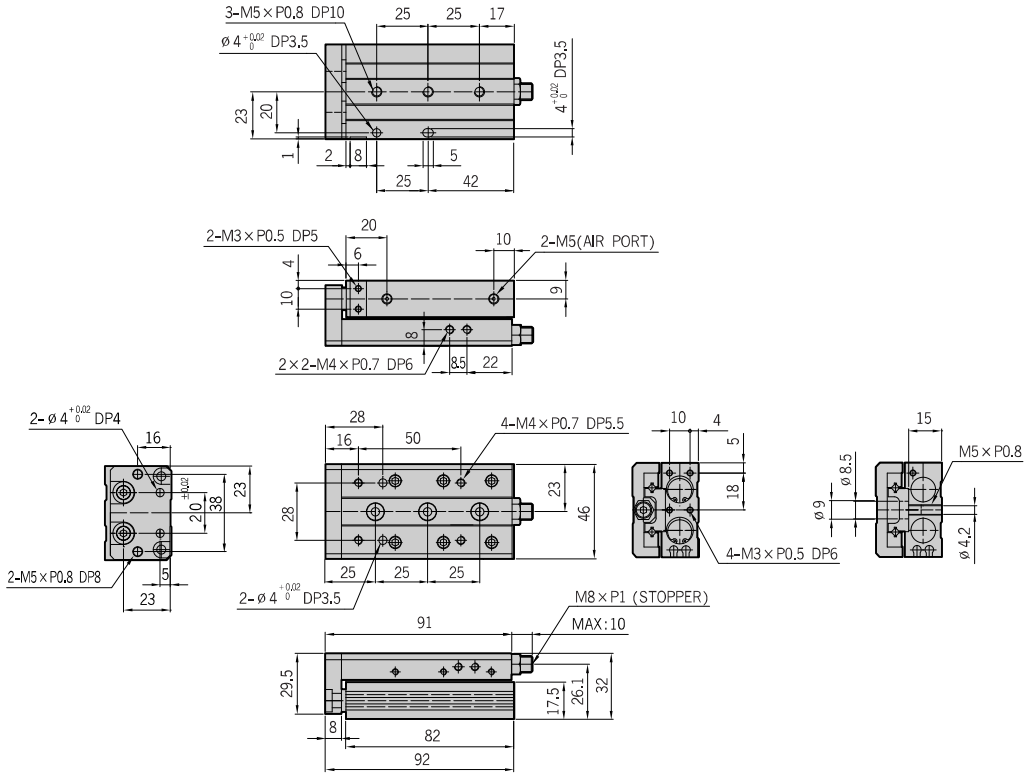


PST-NS Series

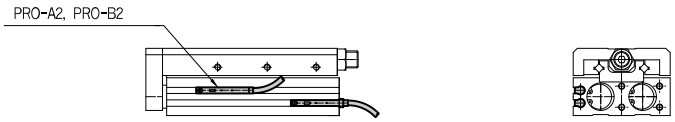
06NS | 08NS | **12NS** | 16NS | 20NS | 25NS

10 | 20 | 30 | **40** | 50 | 75 | 100

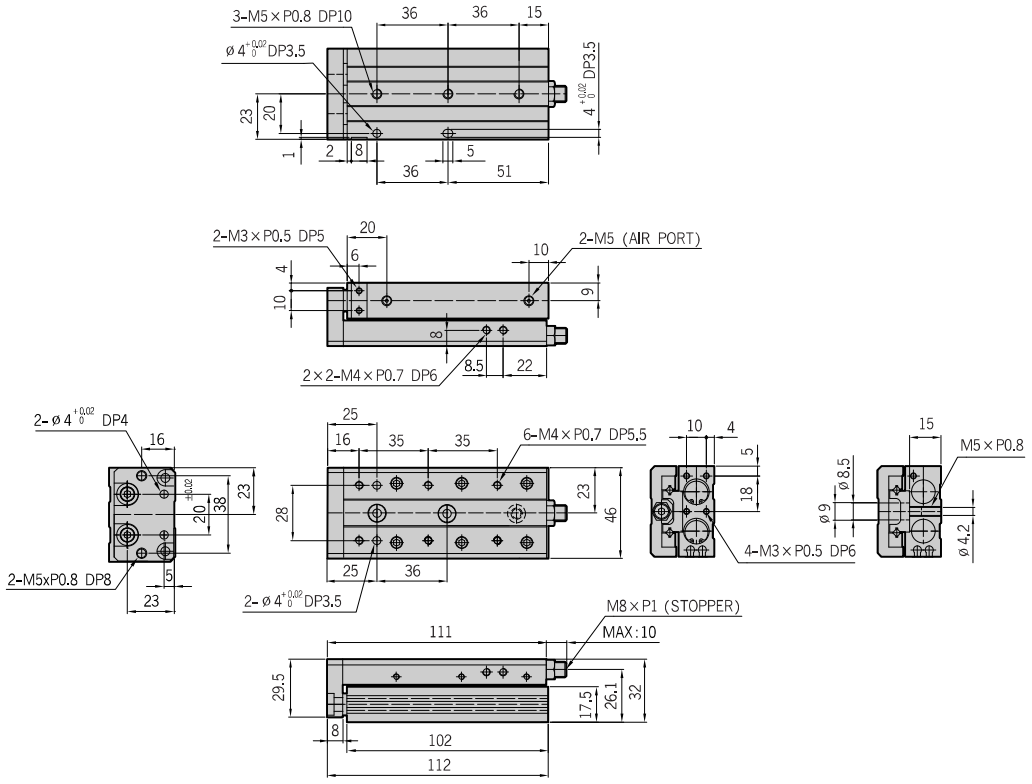
PST12NS-40



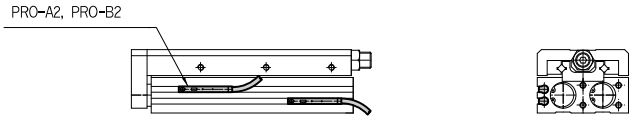
PST12NS-40-Auto Switch



PST12NS-50



PST12NS-50-Auto Switch

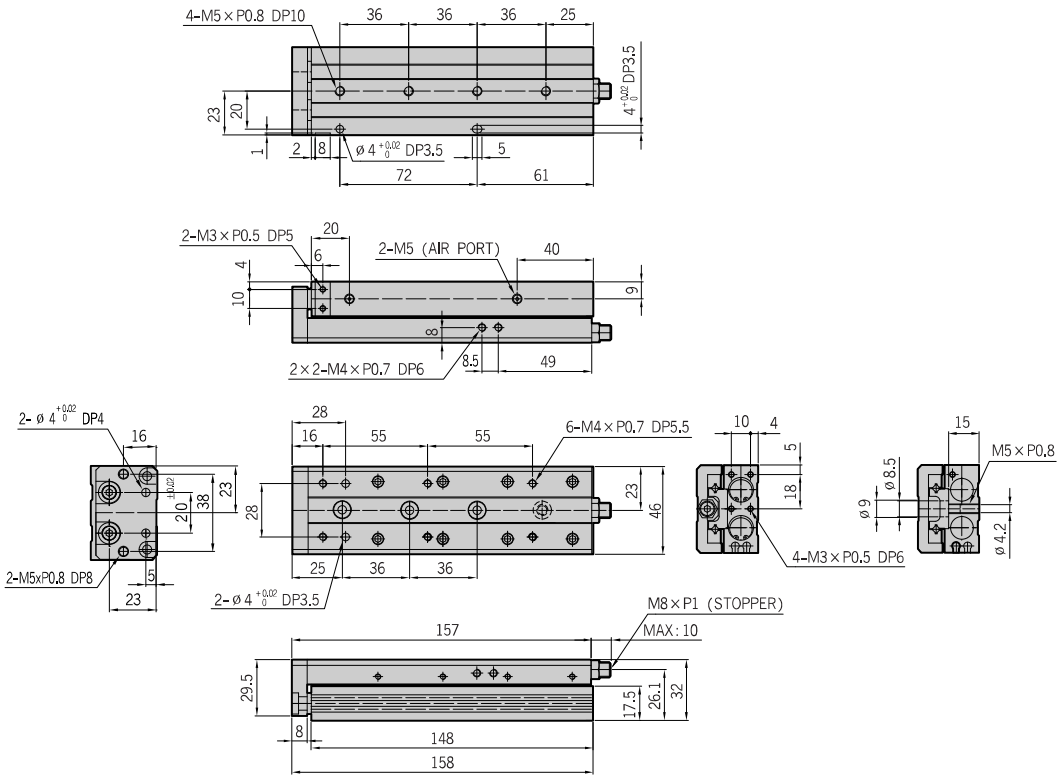


PST-NS Series

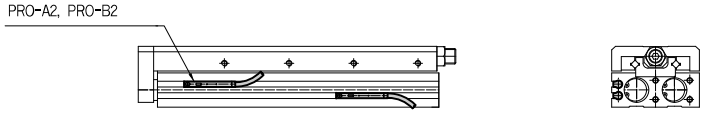
06NS | 08NS | **12NS** | 16NS | 20NS | 25NS

10 | 20 | 30 | 40 | 50 | **75** | 100

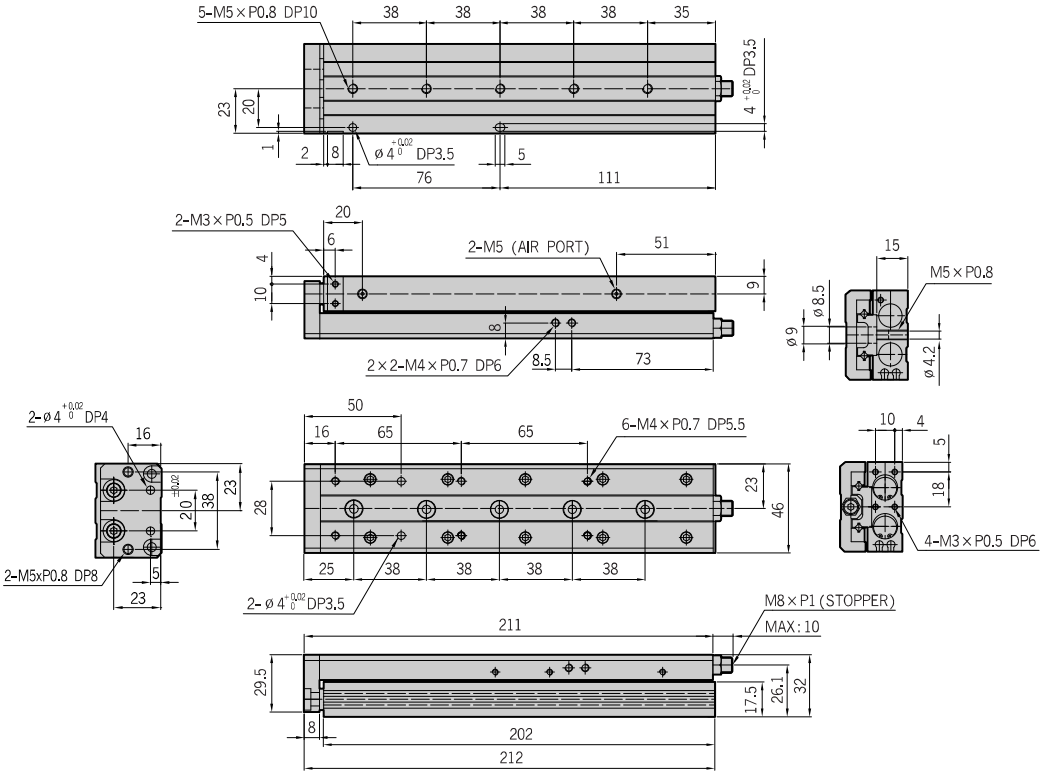
PST12NS-75



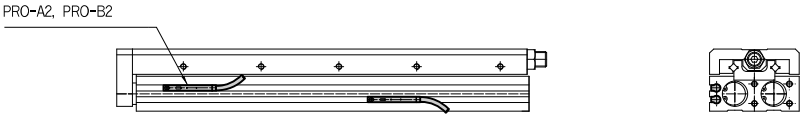
PST12NS-75-Auto Switch



PST12NS-100



PST12NS-100-Auto Switch

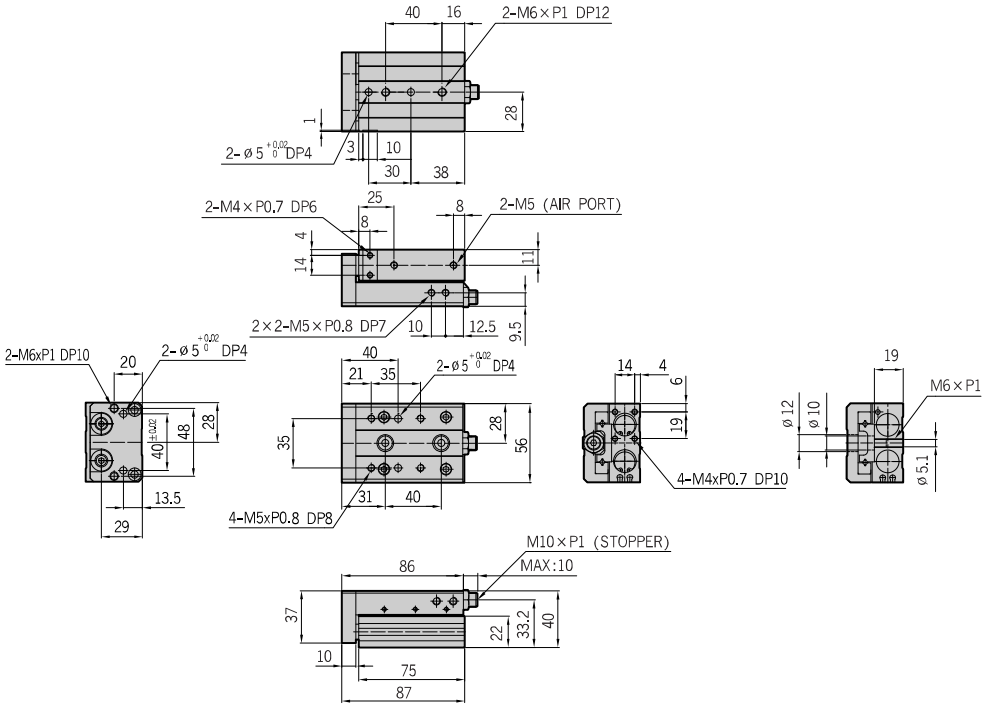


PST-NS Series

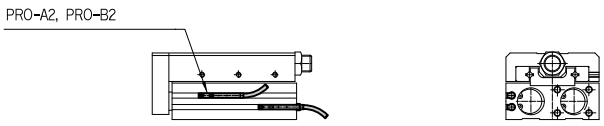
06NS | 08NS | 12NS | **16NS** | 20NS | 25NS

10 **20** **30** 40 50 75 100 125

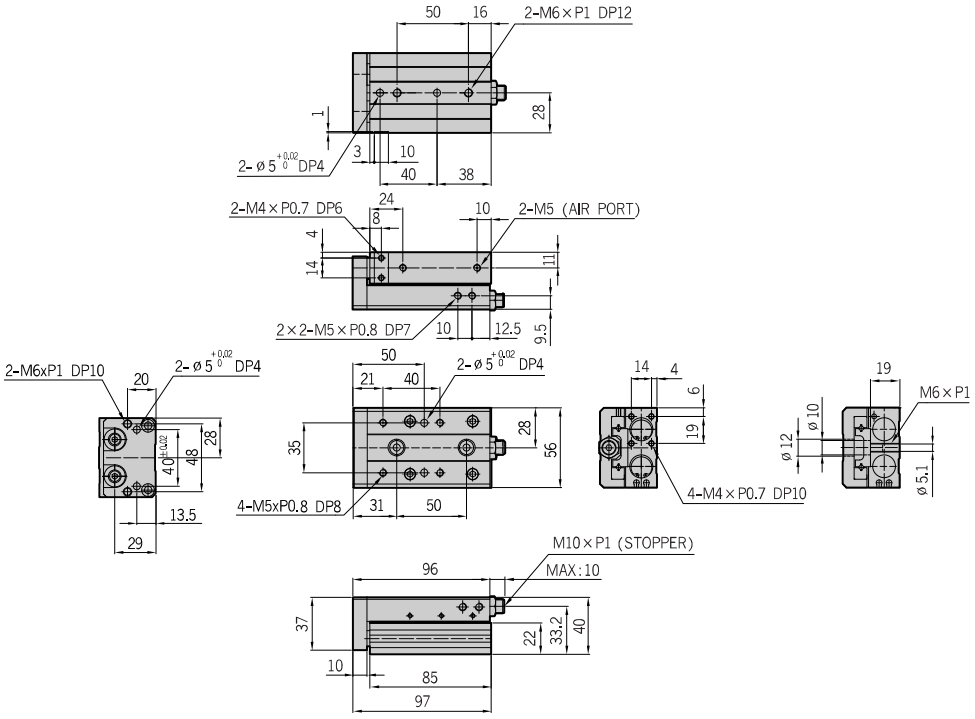
PST16NS-10,20,30



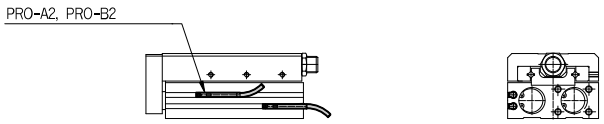
PST16NS-10,20,30-Auto Switch



PST16NS-40



PST16NS-40-Auto Switch

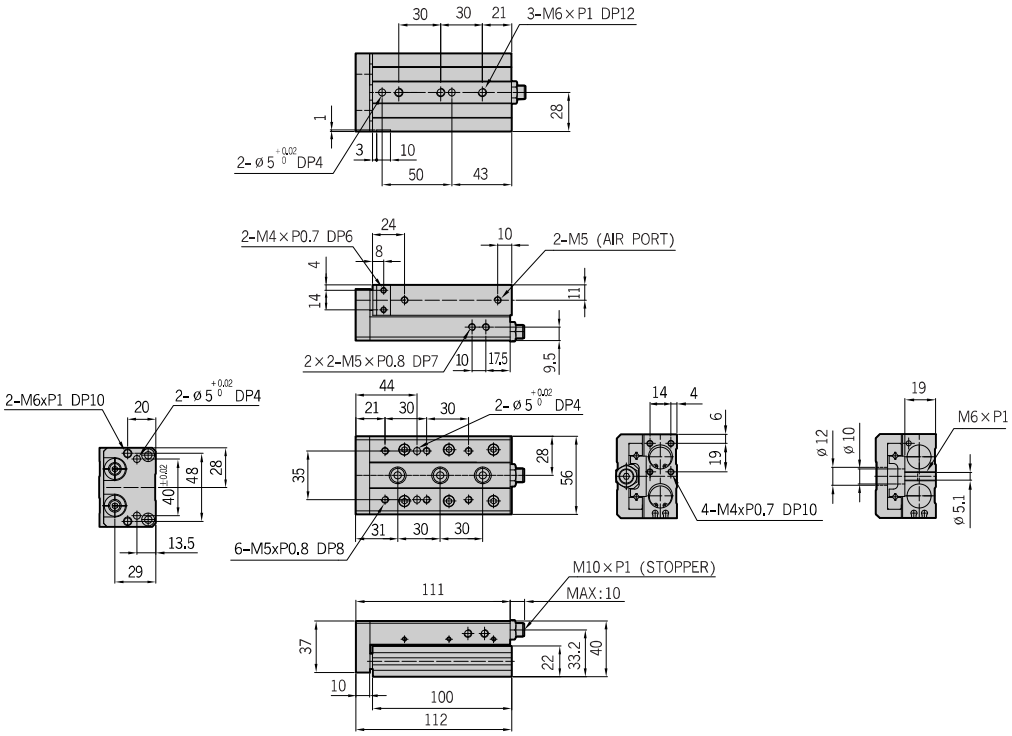


PST-NS Series

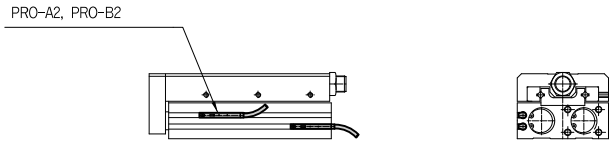
06NS 08NS 12NS **16NS** 20NS 25NS

10 20 30 40 **50** 75 100 125

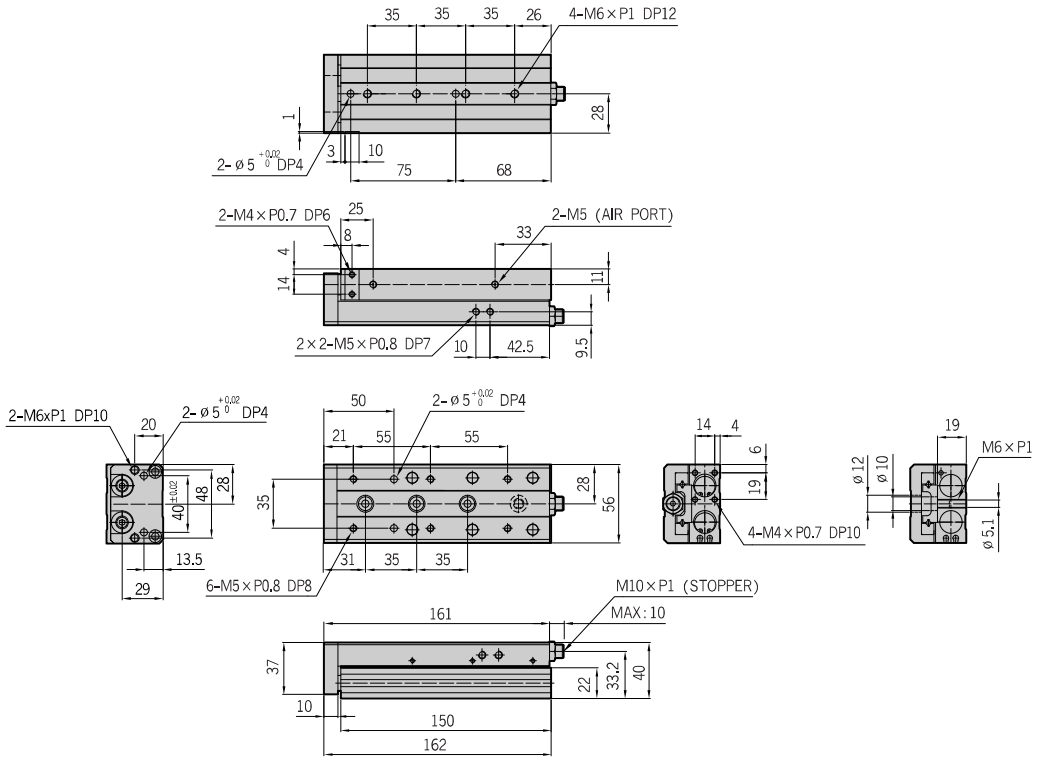
PST16NS-50



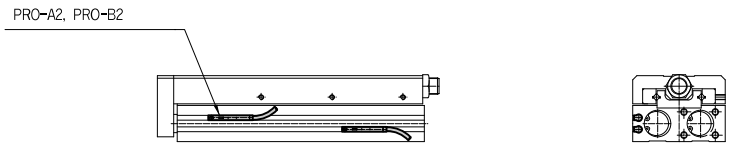
PST16NS-50-Auto Switch



PST16NS-75



PST16NS-75-Auto Switch

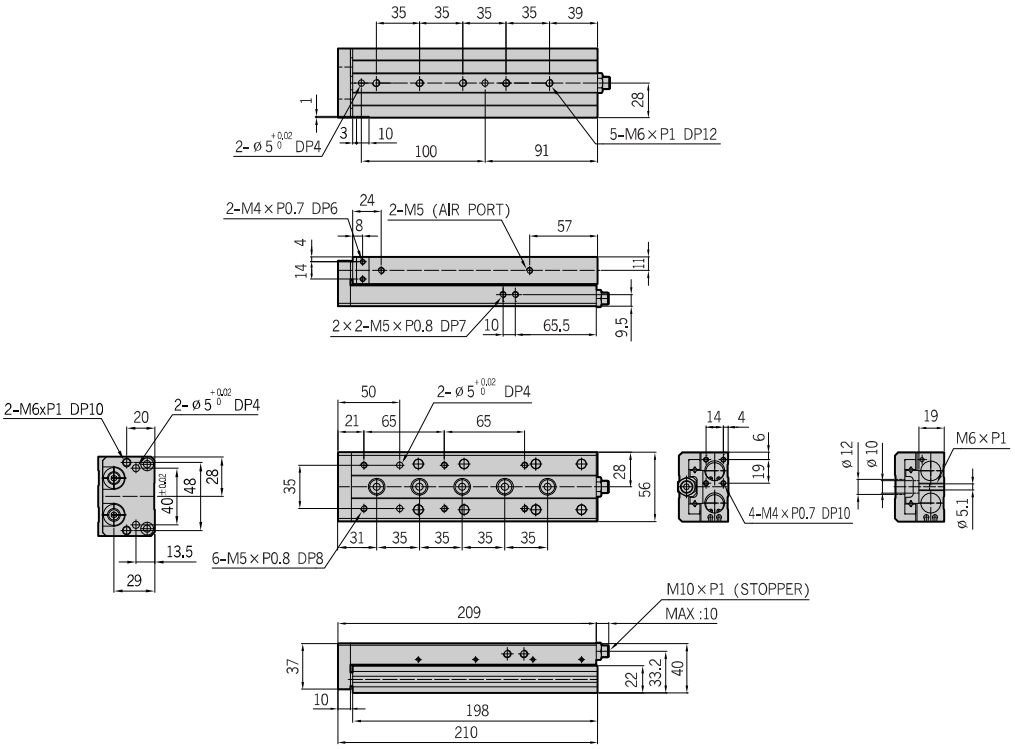


PST-NS Series

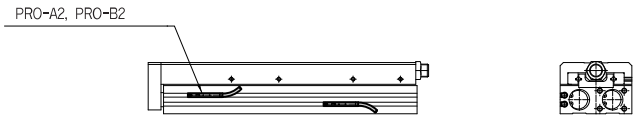
06NS 08NS 12NS **16NS** 20NS 25NS

10 20 30 40 50 75 **100** 125

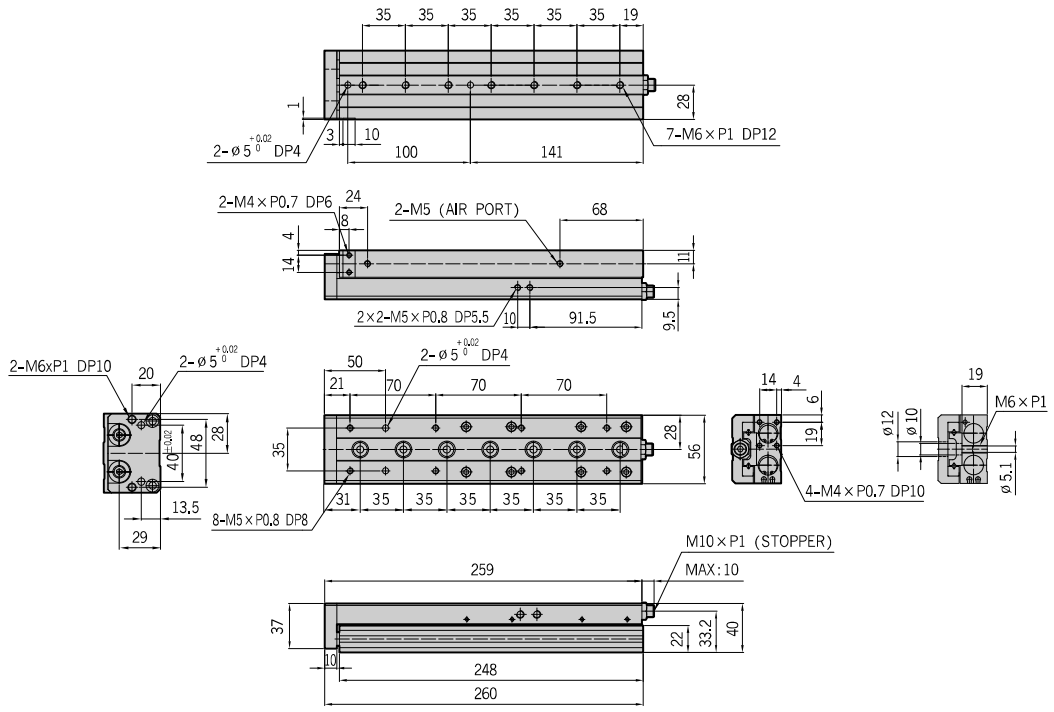
PST16NS-100



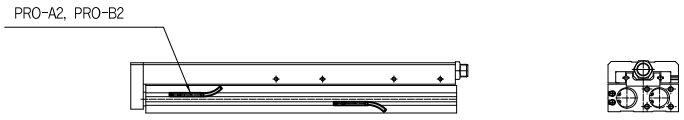
PST16NS-100-Auto Switch



PST16NS-125



PST16NS-125-Auto Switch

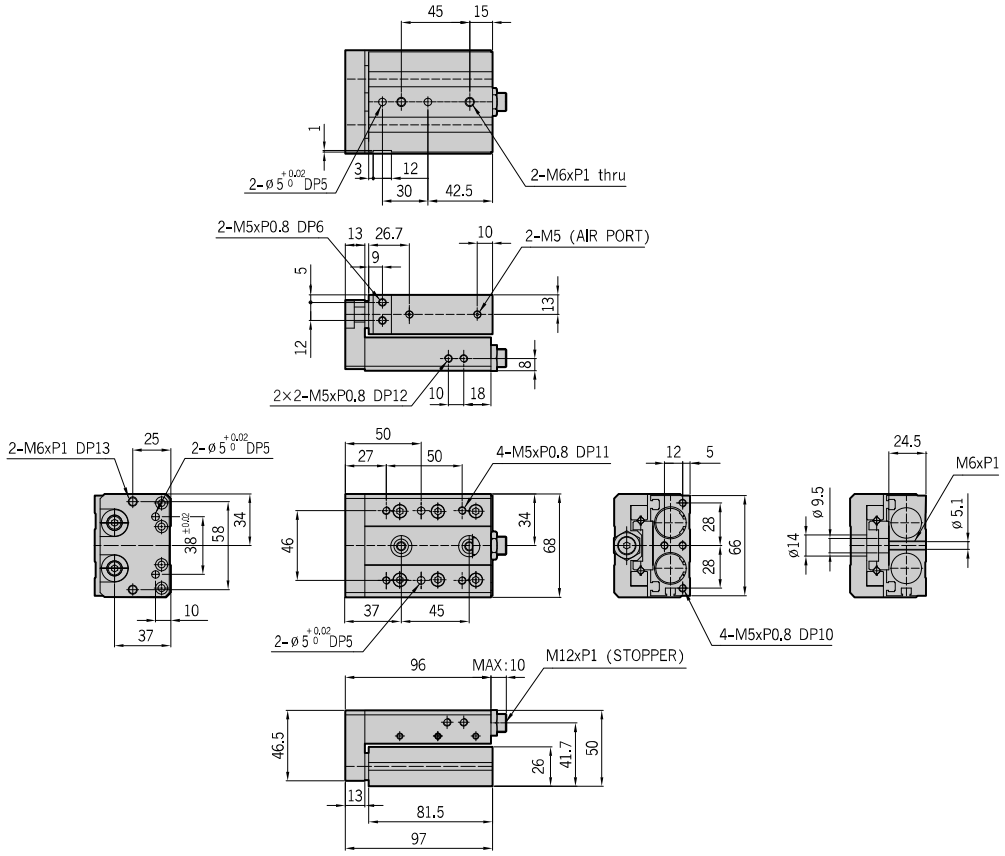


PST-NS Series

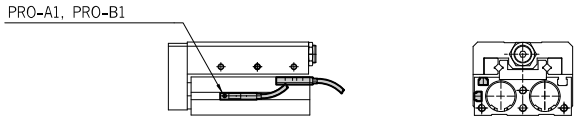
06NS | 08NS | 12NS | 16NS | **20NS** | 25NS

10 | **20** | **30** | 40 | 50 | 75 | 100 | 125 | 150

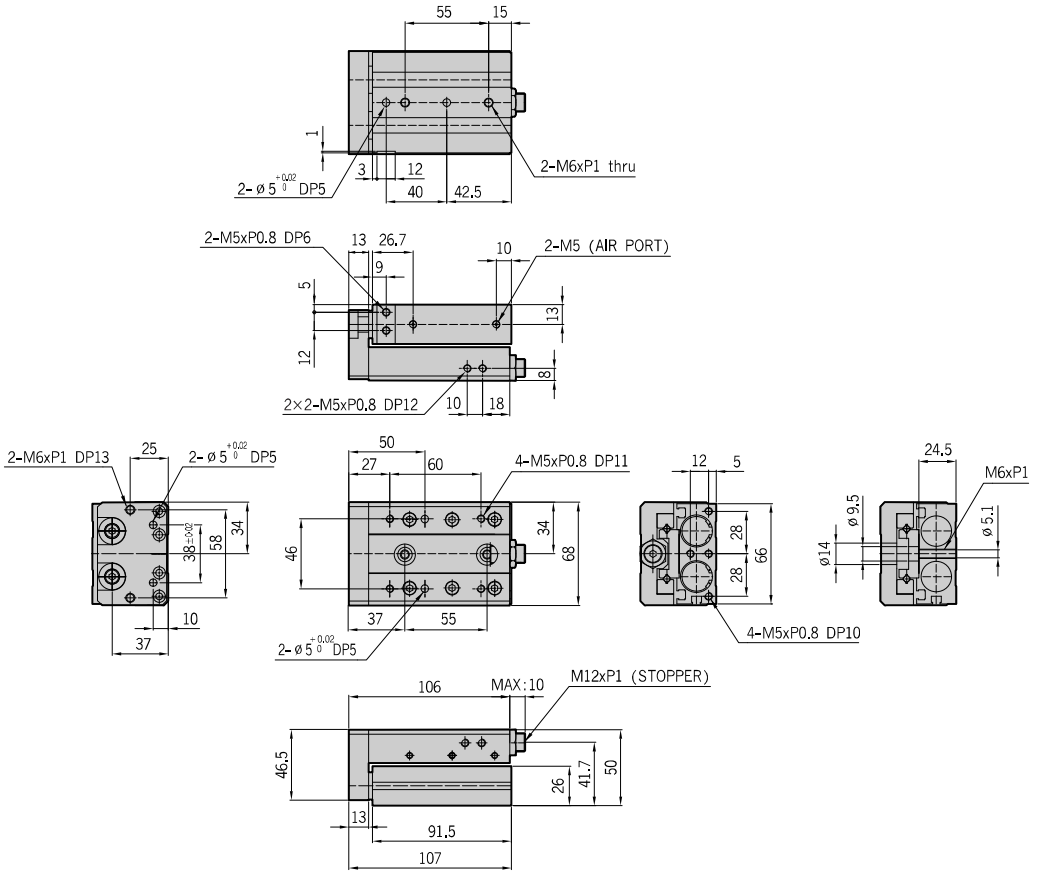
PST20NS-10,20,30



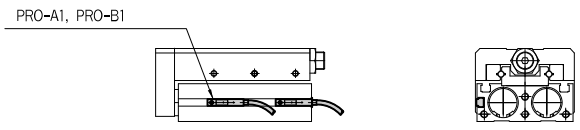
PST20NS-10,20,30-Auto Switch



PST20NS-40



PST20NS-40-Auto Switch

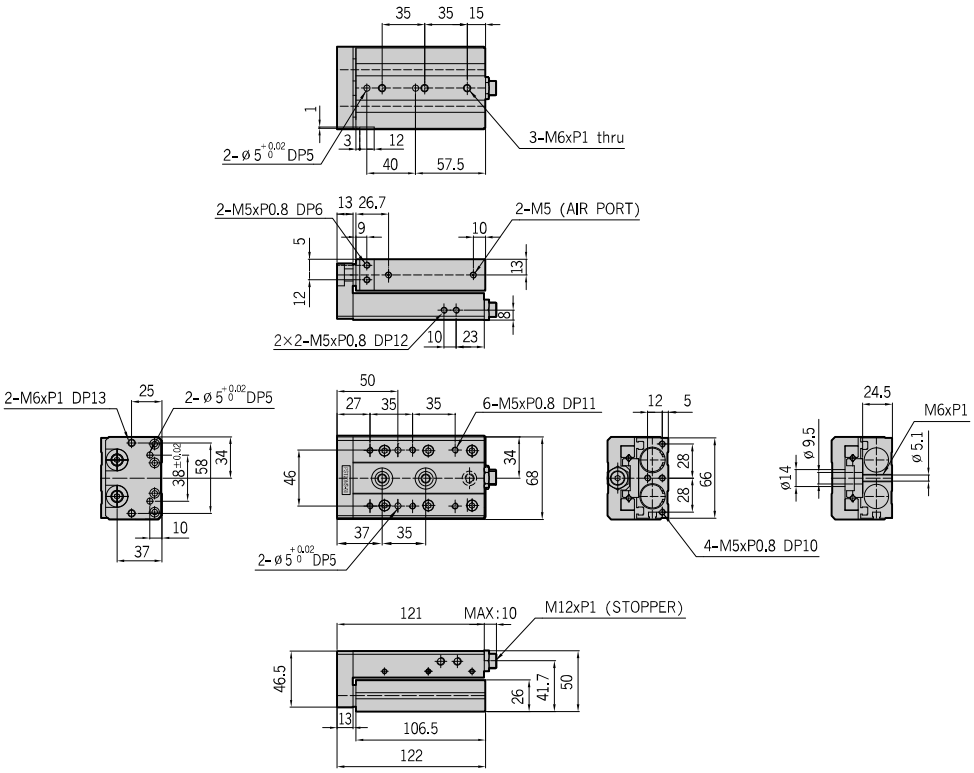


PST-NS Series

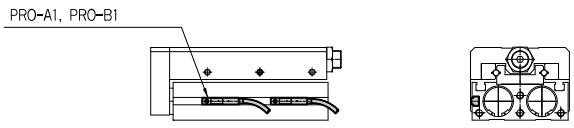
06NS | 08NS | 12NS | 16NS | **20NS** | 25NS

10 | 20 | 30 | 40 | **50** | 75 | 100 | 125 | 150

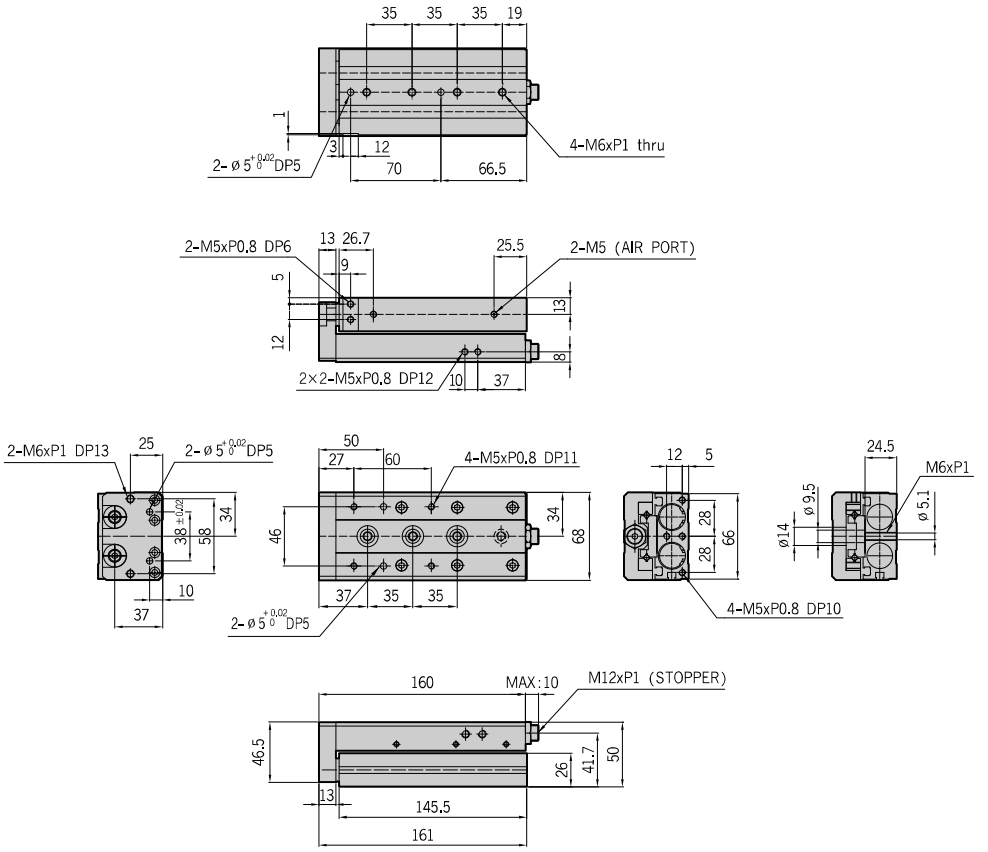
PST20NS-50



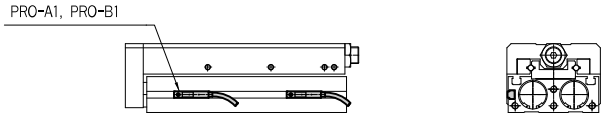
PST20NS-50-Auto Switch



PST20NS-75



PST20NS-75-Auto Switch

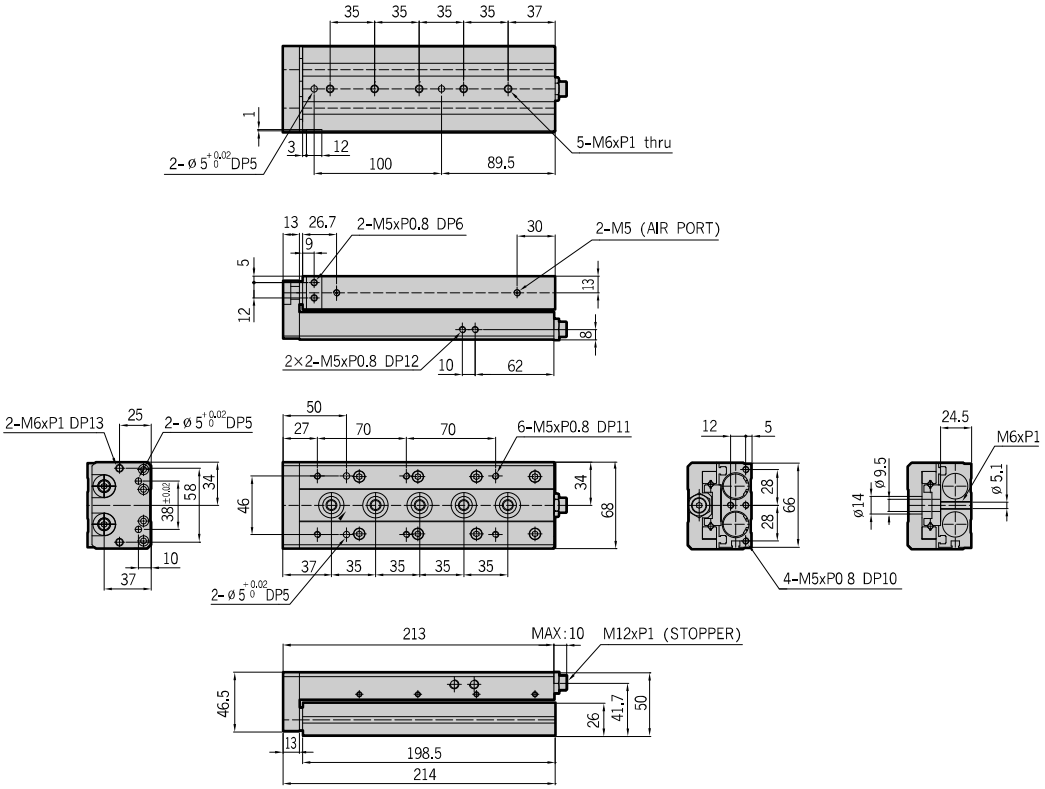


PST-NS Series

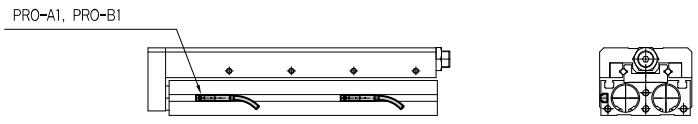
06NS 08NS 12NS 16NS **20NS** 25NS

10 20 30 40 50 75 **100** 125 150

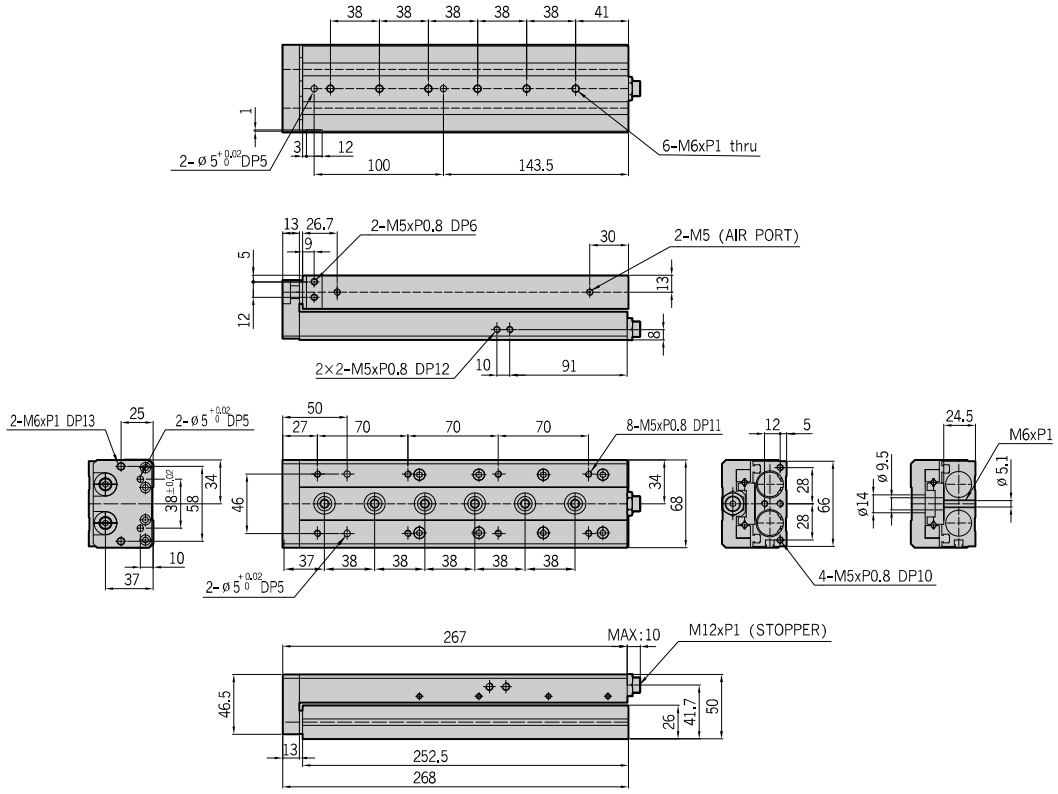
PST20NS-100



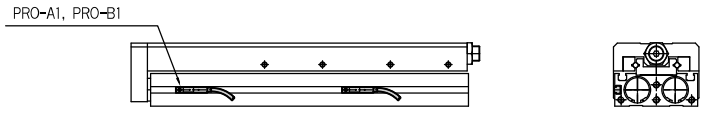
PST20NS-100-Auto Switch



PST20NS-125



PST20NS-125-Auto Switch

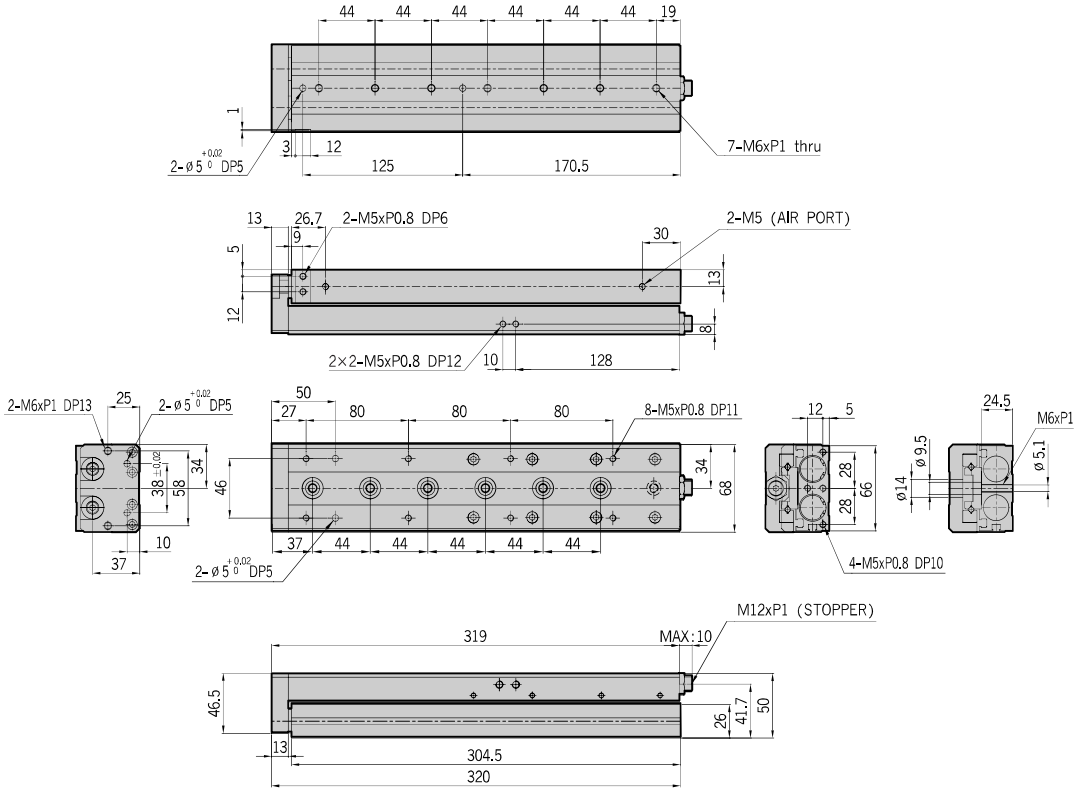


PST-NS Series

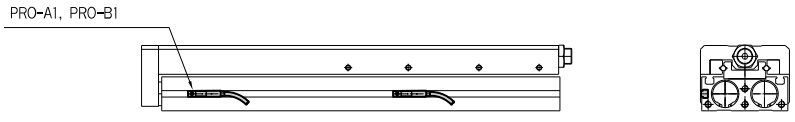
06NS | 08NS | 12NS | 16NS | **20NS** | 25NS

10 | 20 | 30 | 40 | 50 | 75 | 100 | 125 | **150**

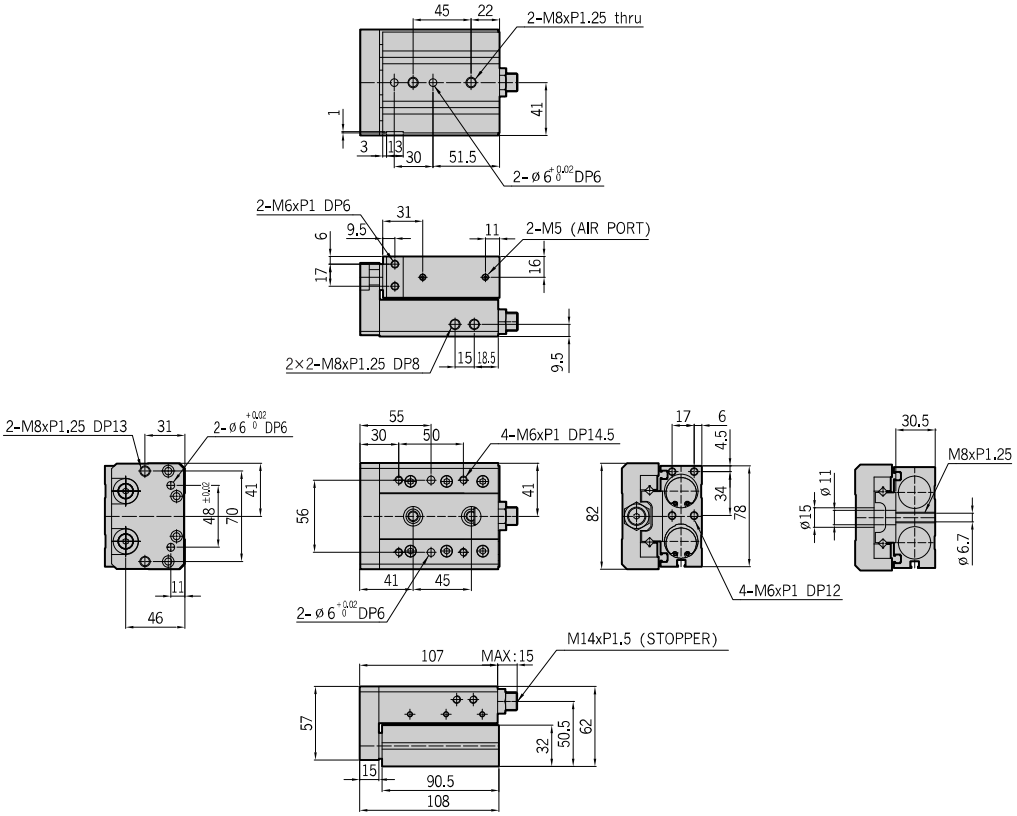
PST20NS-150



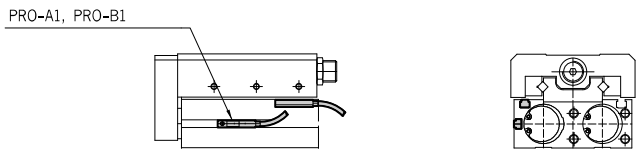
PST20NS-150-Auto Switch



PST25NS-10,20,30



PST25NS-10,20,30-Auto Switch

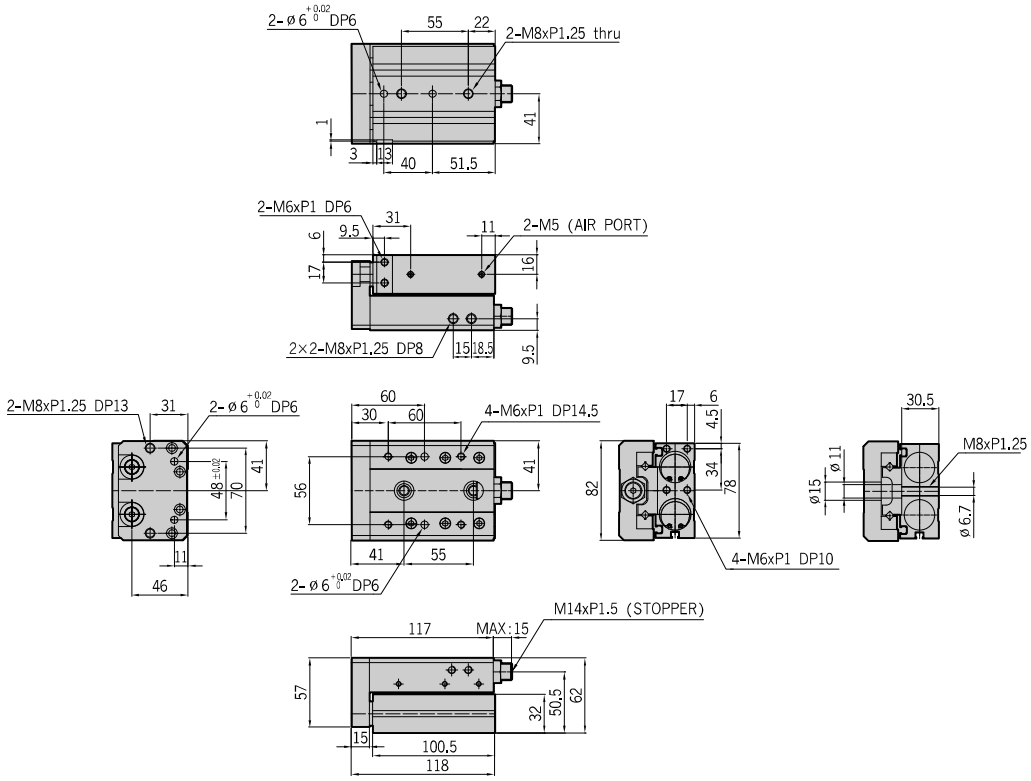


PST-NS Series

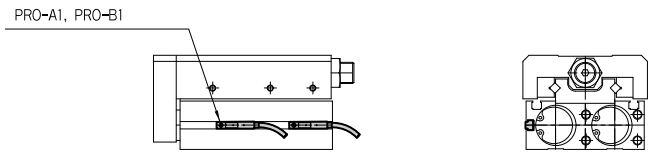
06NS 08NS 12NS 16NS 20NS **25NS**

10 20 30 **40** 50 75 100 125 150

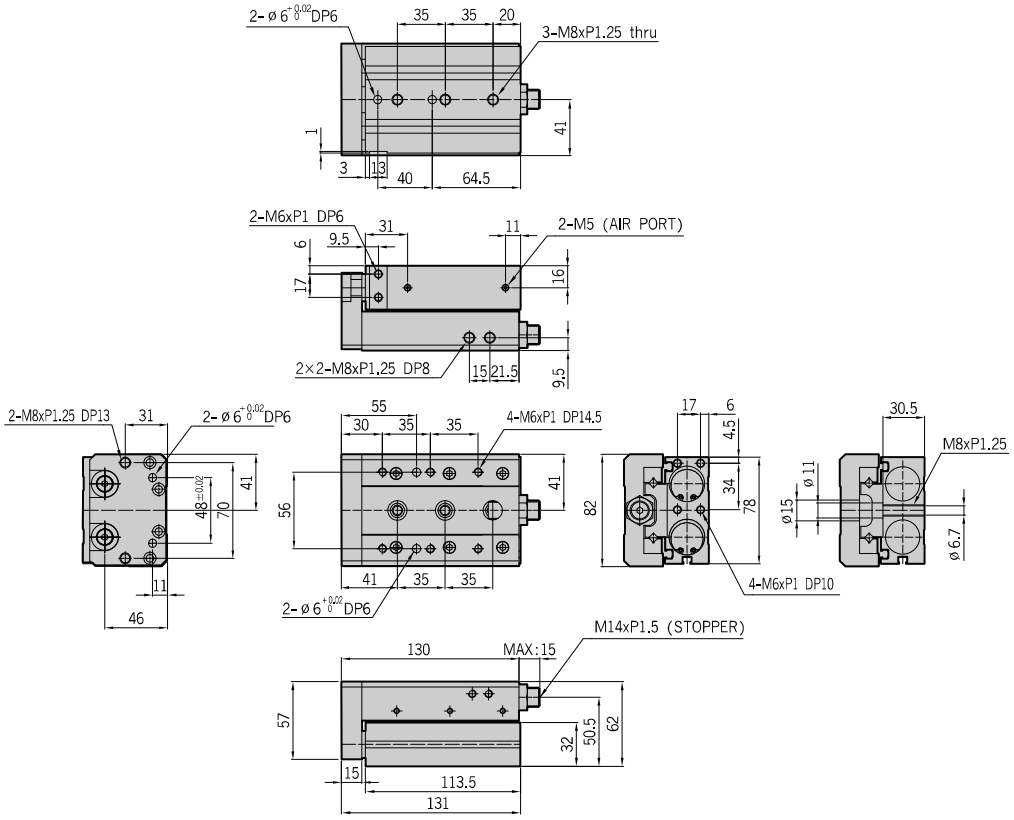
PST25NS-40



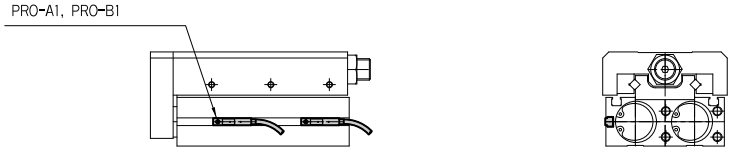
PST25NS-40-Auto Switch



PST25NS-50

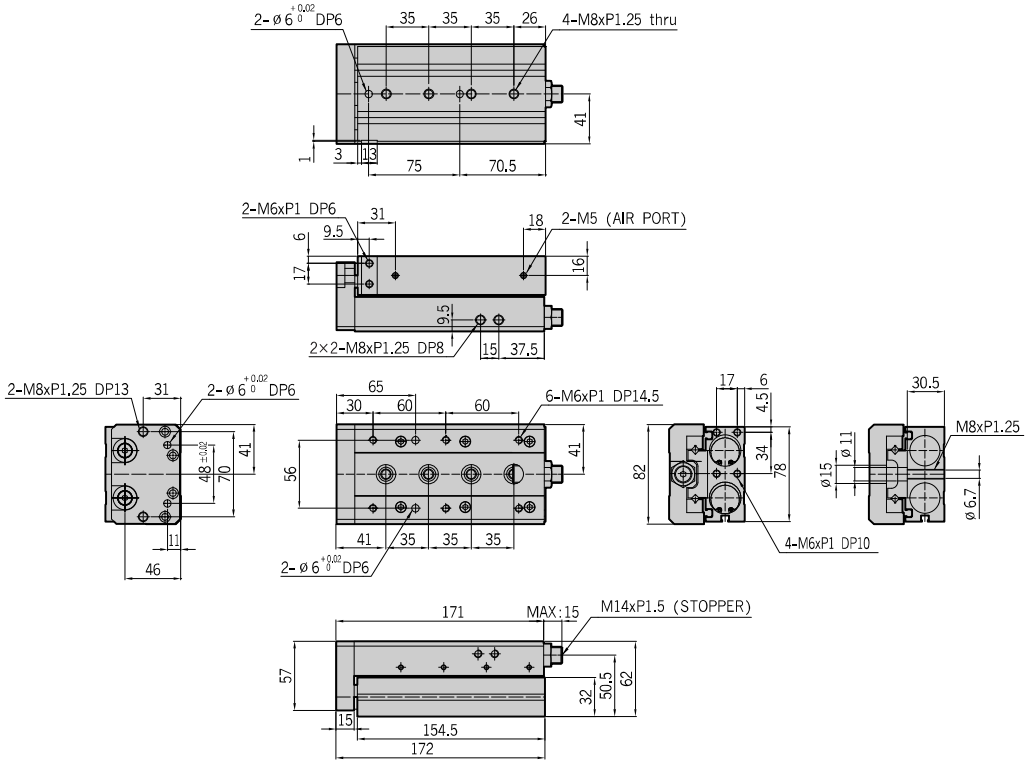


PST25NS-50-Auto Switch

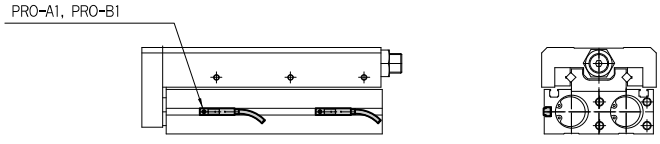


PST-NS Series

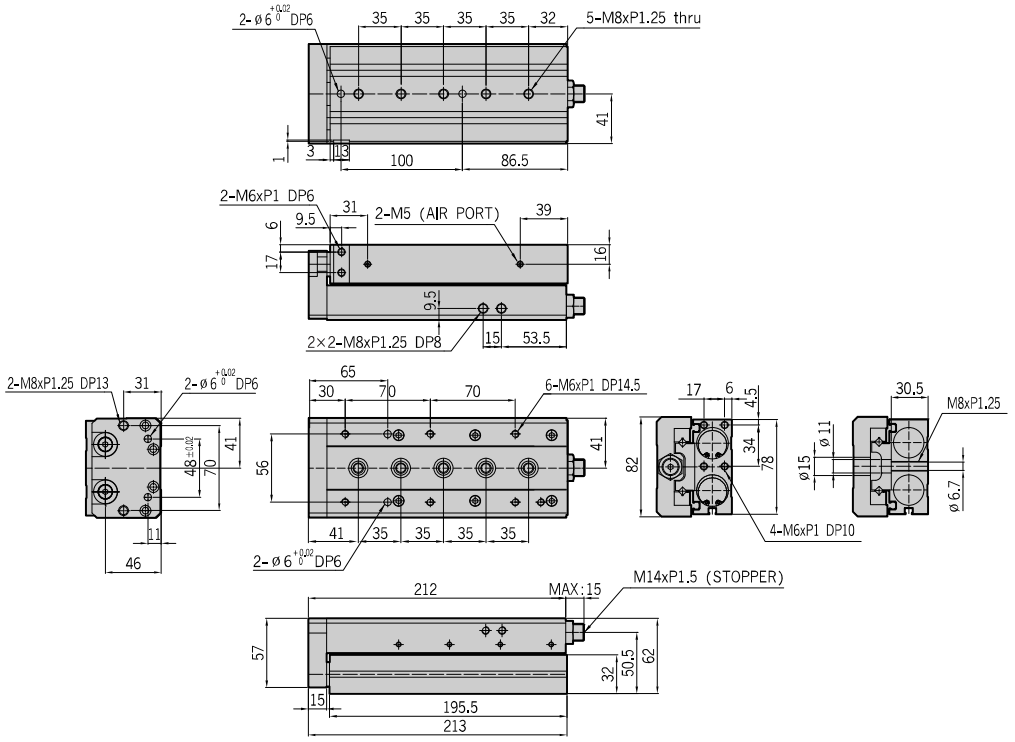
PST25NS-75



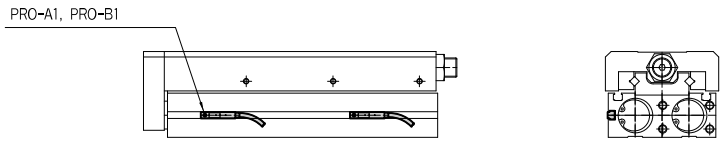
PST25NS-75-Auto Switch



PST25NS-100



PST25NS-100-Auto Switch

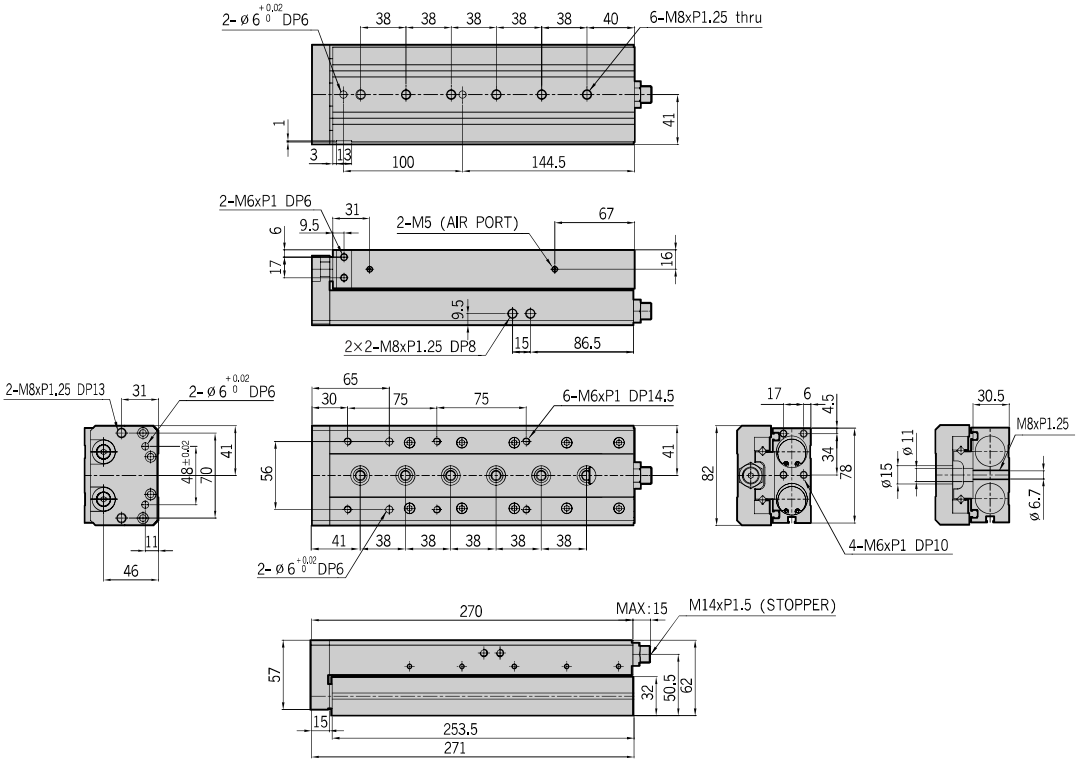


PST-NS Series

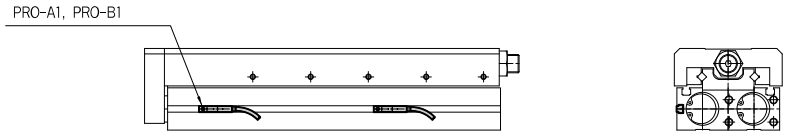
06NS 08NS 12NS 16NS 20NS **25NS**

10 20 30 40 50 75 100 **125** 150

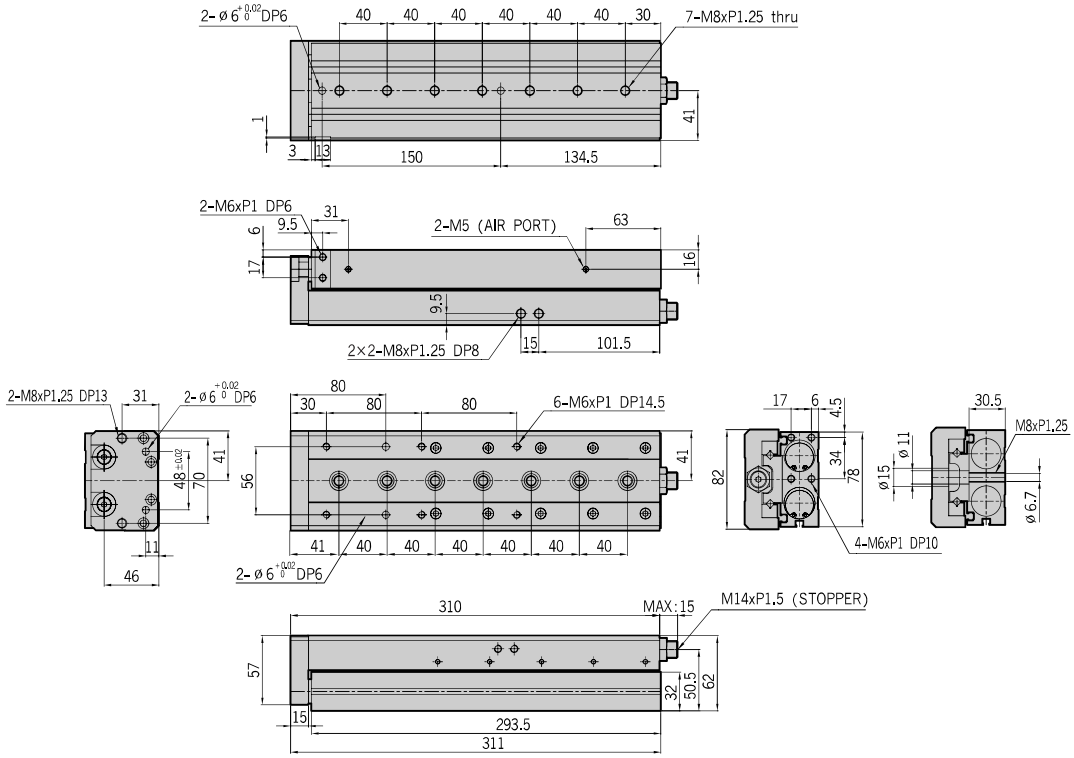
PST25NS-125



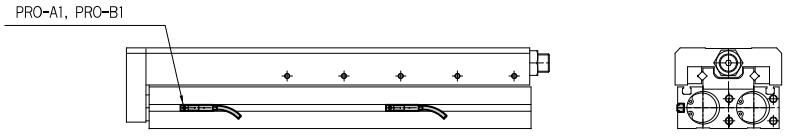
PST25NS-125-Auto Switch



PST25NS-150

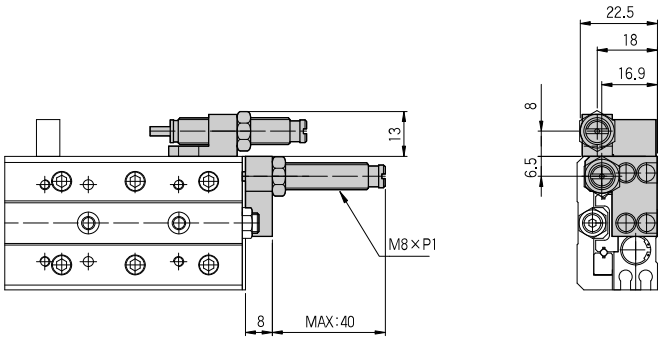


PST25NS-150-Auto Switch

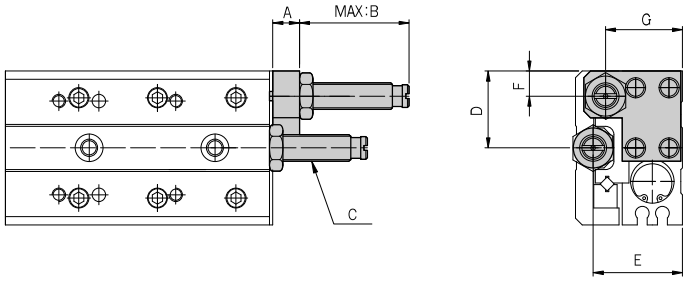


SHOCK ABSORBER Installation drawing

• PST08NS



• PST 12NS, 16NS, 20NS, 25NS

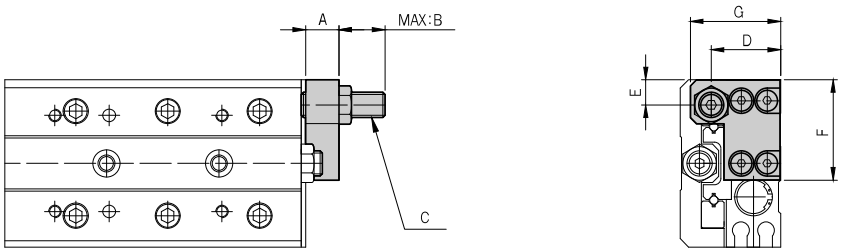


	A	B	C	D	E	F	G
PST12NS	8	40	M8×P1	23	26.1	7.5	23
PST16NS	10	45	M10×P1	28	33.2	10	27.5
PST20NS	12	55	M12×P1	34	41.7	12	35.7
PST25NS	15	75	M14×P1.5	41	50.5	13.5	41.3

※For PST06NS, mounting Shock Absorber is not available.

Backward stopper Installation drawing

• **PST 06NS, 08NS, 12NS, 16NS, 20NS, 25NS**



	A	B	C	D	E	F	G
PST06NS	5	15	M5×P0.8	14.5	5	19.5	19
PST08NS	8	15	M8×P1	16.9	6.5	24	22.4
PST12NS	8	20	M8×P1	23	7.5	27	29.5
PST16NS	10	20	M10×P1	27.5	10	31	35.5
PST20NS	12	25	M12×P1	35.7	12	41	48.7
PST25NS	15	25	M14×P1.5	41.3	13.5	48	60.3