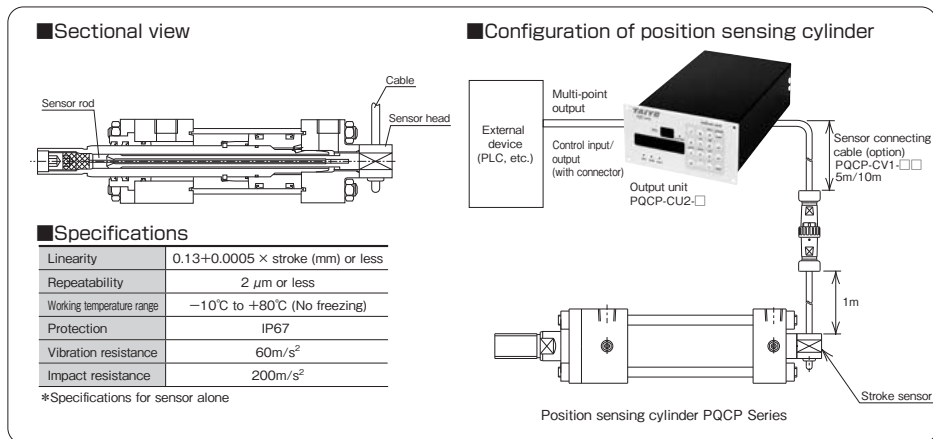


◆System outline

The system consists of a position sensing cylinder with a built-in stroke sensor (Induct Coder) and an output unit for controlling the system.



Cylinder with advanced stroke sensor

Incorporation of a stroke sensor in the important part of the position detecting function realizes high performance, downsizing and cost reduction.

The stroke sensor is completely integrated in the cylinder rod. The completely non-contact detecting type sensor fully exercises its performance to ensure the repeatability and accuracy of industrial machinery under severe working conditions. In addition, it is maintenance-free.

Other features

- Excellent repeatability
- Significantly low temperature drift
- The sensor uses the principle of AC magnetic circuit and causes no hysteresis.
- Super-high resolution, super-high speed response and high accuracy
- Since the cylinder does not use electronic elements in the sensor block, it excels in thermal resistance and impact resistance.

Actuator specifications

Specifications	With stroke sensor			
Series name	PQCP			
Nominal pressure	5 MPa*1·7 MPa·14 MPa			
Stroke (mm)	50-100-150-200-250-300-350-400-450-500			
Bore (mm)	φ50	φ63	φ80	φ100
Logic output (kN)	7 MPa	10*1	20	35
	14 MPa	25	40	70
Mounting style	SD-LA-FE-FY-TA-TC			
Resolution	1 μm			
Sensor type	Linear Induct Coder*2			

*1) Nominal pressure of φ50 with rod B is 5 MPa.
*2) Incremental type

Output unit with high functions

An output unit was developed to maximize the functions of Induct Coder.

The output unit developed by **TAIYO** is used to obtain position data from the stroke sensor connected directly with the unit. It can be connected directly with I/O of a programmable controller, etc.

The unit is provided with a display, ABZ phases and 24-bit binary outputs as standard devices, and optional 14-point output signals which enable to set any ON and OFF positions and output the positions as sensor signals can be selected. Any numbers can be designated from the set 14 points by the programmable controller and fetched as outputs separately from the 14 points to reduce the number of high-order I/O points.

Output unit (position output unit)



- Position data is displayed in 5 digits. ABZ phases and binary outputs are provided as standard devices.
- A multi-point output function can be added to the position data output.
- Addition of the multi-point output function enables to set any ON/OFF positions.

Specifications

Type	PQCP
Applicable transducer	Magnetic inductive position sensor (Linear Induct Coder)
Load which can be driven	75 Ω or more/10 KHz
Input impedance	Approx. 5 KΩ
Display range	±99999
Resolution	Display (min.) 0.001mm Binary output 1 μm ABZ-phase output 16 μm/p
Sampling speed	1000 times/sec
Display speed	10 times/sec
Display method	7-segment LED display
Control input	No-voltage input (With contact, No contact)
Control output	NPN open collector
Supply voltage	100 V AC±10% 50/60Hz
Working ambient temperature	0 to +50°C
Working ambient humidity	35 to 85%RH (No condensing)
Weight	Approx. 1500 g
Power consumption	18 VA or less

External input/output

Terminal block		Connector No.2	
Pin No.	Description	Pin No.	Description
1	Pulse output common	1	0 setting signal input
2	Pulse output (Z-phase output)	2	Position data hold signal input
3	Pulse output (B-phase output)	3	Error cancel signal input
4	Pulse output (A-phase output)	7 to 10	Selection signal input
5 to 10	Stroke sensor signal	11 to 12	Input common
11	Stroke sensor shield	13 to 36	24-bit binary data output
		37	Read timing signal output
		38	Error signal output
		41 to 42	Output common

Connector No.1	
Pin No.	Description
1 to 14	Multi-point output signal
15	High-order selection output
17 to 18	Output common

Notes) ●Use a binary data input unit having a response time of 1 ms or less.
For the ABZ-phase input, use a high-speed counter of 100 kpps or less.
●The maximum speed of external output data is 100 mm/s.
●Optional binary-to-analog converter unit PQCP-CU1-DAOP is available.

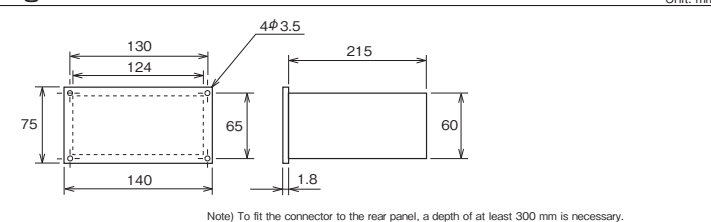
Cable type

- For cylinder output unit PQCP-CV1-05-D
Length 05: 5m
10: 10m
- For the robot cable type unit, add "R" to the code.
Example: PQCP-CV1-05-D-R
- Power cable supplied (1.5 m)
- Connector supplied

Output unit specifications

Name	Position output unit	
	PQCP-CU2-A	PQCP-CU2-B
Type		
Functions	<ul style="list-style-type: none"> ·Multi-point output ·Display of position ·Binary output ·ABZ-phase output 	<ul style="list-style-type: none"> ·Display of position ·Binary output ·ABZ-phase output

Dimensional drawing



Panel cutting size



How to order

● Standard for 7 MPa (PQCP-NH) 1 FY 50 B B 100 - A B 00 0
 ● For 7 MPa, with sensor (PQCP-NHR) 1 FY 50 B B 100 - A B AH 1
 ● Standard for 14 MPa (PQCP-HH) 1 FE 50 A B 100 - A B 00 0
 ● For 14 MPa, with sensor (PQCP-HHR) 1 FE 50 A B 100 - A B AH 1

Type: PQCP-NH, PQCP-NHR, PQCP-HH, PQCP-HHR
 Seal material: FY, FE
 Mounting style: 50
 Cylinder bore: B
 Rod type: B
 Cushioning: 100
 Stroke (mm): -
 Port position: A, B
 Cushion valve position: 00, AH
 Sensor symbol: 0, 1
 Sensor quantity: 1, 2 to n

Nitrile rubber
 For 7 MPa: LA, FC, FY, TA and TC
 For 14 MPa: LA, FY (except φ50), FE (only φ50), TA and TC

φ50, φ63, φ80, φ100
 For 7 MPa: Rod B
 For 14 MPa: Rod B (rod A only for φ50)

B Both ends cushioned
 R With cushion on rod side
 H With cushion on cap side
 N No cushion

A, B, C, D, O
 A, B, C, D
 50, 100, 150, 200, 250
 300, 350, 400, 450, 500

When requiring a cylinder having a non-standard stroke, consult us about the seal material.
One rod end lock nut is supplied.

Sensor list

Type	Sensor symbol	Load voltage range	Load current range	Max. switching capacity	Protective circuit	Indicating lamp	Wiring method	Cord length	Applicable load
Reed sensor	AH AX111CE	DC:5 to 30V	DC:5 to 40mA	DC:1.5W AC:2VA	Provided	LED (lights in red when sensing)	0.3 mm ² , 2-core, external diameter φ4 Rear wiring	1.5m	Small relay Programmable controller
	AJ AX115CE	DC:5 to 120V	AC:5 to 20mA		None	None		5m	
	AE AX125CE	DC: 30 V or less AC: 120 V or less	DC: 40 mA or less AC: 5 to 20mA	2VA	Provided	LED (lights in red when sensing)	4-pin connector type Rear wiring	0.5m	
	AK AX11ACE	AC:5 to 120V	5 to 20mA					0.5m	
Solid state sensor	AL AX11BCE	DC:5 to 30V	5 to 40mA	1.5W	Provided	LED (lights in red when sensing) LED (two-LED type, red and green)	0.3 mm ² , 2-core, external diameter φ4 Rear wiring	1.5m	Small relay Programmable controller
	BE AX201CE-1	DC:5 to 30V	5 to 40mA	—				5m	
	BF AX205CE-1							1.5m	
	CE AX211CE-1							5m	
	CF AX215CE-1							1.5m	
	CT AX211CE-1							5m	
	CU AX215CE-1							0.5m	
	CV AX21BCE-1							1.5m	
	CW AZ211CE-1							5m	
	CX AZ215CE-1							0.5m	
CY AZ21BCE-1	0.5m								

Notes) ● When any induction load (relay, etc.) is used for a sensor without a protective circuit, fit a protective circuit (SK-100) to the load without fail.
● For handling of the sensors, read the sensor specifications at the end of this book.

Standard type

AX type sensor

Cord type

Connector type

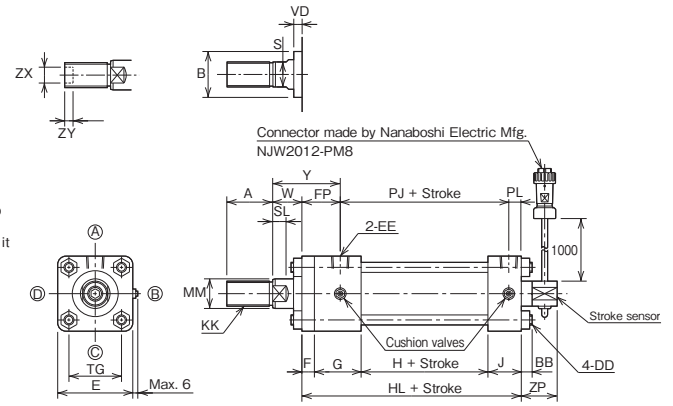


SD

PQCP - NH 1 SD Bore B B Stroke - A B Sensor symbol Sensor quantity

Nominal pressure	Bore	ZX	ZY
5 MPa	φ50		
	φ63	φ19	10
7 MPa	φ80		
	φ100	φ25	20
14 MPa	φ50	φ19	10
	φ63		
	φ80		
	φ100	φ25	20

The stroke sensor is internal in the top of piston rod.
When using a spring pin or the like, fit it in the range of ZY from the end face.

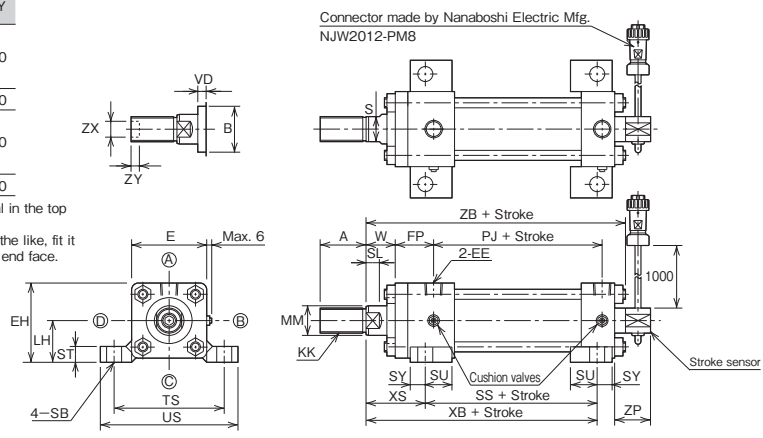


LA

PQCP - NH 1 LA Bore B B Stroke - A B Sensor symbol Sensor quantity

Nominal pressure	Bore	ZX	ZY
5 MPa	φ50		
	φ63	φ19	10
7 MPa	φ80		
	φ100	φ25	20
14 MPa	φ50	φ19	10
	φ63		
	φ80		
	φ100	φ25	20

The stroke sensor is internal in the top of piston rod.
When using a spring pin or the like, fit it in the range of ZY from the end face.



Dimensional table/SD

Nominal pressure	Output	Bore	Rod type	A	B	KK	MM	S	SL	VD	BB	DD	E	
5 MPa	10kN	φ50	B type	45	φ46	M24×1.5	φ28	24	14	10	11	M10×1.25	□76	
	20kN	φ63		55	φ55	M30×1.5	φ35.5	30	16	10	13	M12×1.5	□90	
7 MPa	35kN	φ80		70	φ65	M39×1.5	φ45	41	20	10	16	M16×1.5	□110	
	50kN	φ100		85	φ80	M48×1.5	φ56	50	23	10	18	M18×1.5	□135	
14 MPa	25kN	φ50		A type	55	φ50	M30×1.5	φ35.5	30	16	17	11	M10×1.25	□76
	40kN	φ63		B type	55	φ55	M30×1.5	φ35.5	30	16	10	13	M12×1.5	□90
	70kN	φ80	70		φ65	M39×1.5	φ45	41	20	10	16	M16×1.5	□110	
	100kN	φ100		85	φ80	M48×1.5	φ56	50	23	10	18	M18×1.5	□135	

Nominal pressure	EE	F	FP	G	H	HL	J	PJ	PL	TG	W	Y	ZP
5 MPa	Rc1/2	13	42	54	48	155	40	98	15	□52	30	72	43
	Rc3/4	15	46	56	52	163	40	102	15	□63	35	81	43
7 MPa	Rc3/4	18	56	66	54	184	46	110	18	□80	35	91	43
	Rc3/4	20	58	66	60	205	59	116	31	□102	40	98	30
14 MPa	Rc1/2	13	42	54	48	155	40	98	15	□52	41	83	43
	Rc1/2	15	46	56	52	163	40	102	15	□63	35	81	43
	Rc3/4	18	56	66	54	184	46	110	18	□80	35	91	43
	Rc3/4	20	58	66	60	205	59	116	31	□102	40	98	30

Dimensional table/LA

Nominal pressure	Output	Bore	Rod type	A	B	KK	MM	S	SL	VD	E	EE	EH	
5 MPa	10kN	φ50	B type	45	φ46	M24×1.5	φ28	24	14	10	□76	Rc1/2	83	
	20kN	φ63		55	φ55	M30×1.5	φ35.5	30	16	10	□90	Rc1/2	95	
7 MPa	35kN	φ80		70	φ65	M39×1.5	φ45	41	20	10	□110	Rc3/4	115	
	50kN	φ100		85	φ80	M48×1.5	φ56	50	23	10	□135	Rc3/4	138.5	
14 MPa	25kN	φ50		A type	55	φ50	M30×1.5	φ35.5	30	16	17	□76	Rc1/2	83
	40kN	φ63		B type	55	φ55	M30×1.5	φ35.5	30	16	10	□90	Rc1/2	95
	70kN	φ80	70		φ65	M39×1.5	φ45	41	20	10	□110	Rc3/4	115	
	100kN	φ100		85	φ80	M48×1.5	φ56	50	23	10	□135	Rc3/4	138.5	

Nominal pressure	FP	LH	PJ	SB	SS	ST	SU	SY	TS	US	W	XB	XS	ZB	ZP
5 MPa	42	45±0.15	98	φ14	108	17	34	14	115	145	30	168	60	196	43
	46	50±0.15	102	φ18	106	19	32	18	132	165	35	177	71	211	43
7 MPa	56	60±0.25	110	φ18	124	25	42	18	155	190	35	198	74	235	43
	58	71±0.25	116	φ22	122	27	38	22	190	230	40	207	85	263	30
14 MPa	42	45±0.15	98	φ14	108	17	34	14	115	145	41	179	71	207	43
	46	50±0.15	102	φ18	106	19	32	18	132	165	35	177	71	211	43
	56	60±0.25	110	φ18	124	25	42	18	155	190	35	198	74	235	43
	58	71±0.25	116	φ22	122	27	38	22	190	230	40	207	85	263	30

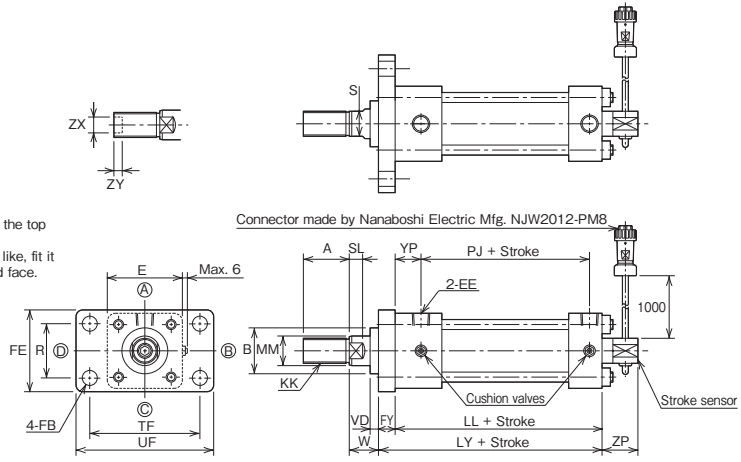
FY·FE

PQCP - NH 1 FY Bore B B Stroke - A B Sensor symbol Sensor quantity

Nominal pressure	Bore	ZX	ZY
5 MPa	φ50		
	φ63	φ19	10
7 MPa	φ80		
	φ100	φ25	20
14 MPa	φ50		
	φ63	φ19	10
	φ80		
	φ100	φ25	20

The stroke sensor is internal in the top of piston rod.
When using a spring pin or the like, fit it in the range of ZY from the end face.

The mounting style of 14-MPa φ50 is FE because the cylinder uses the rod A.



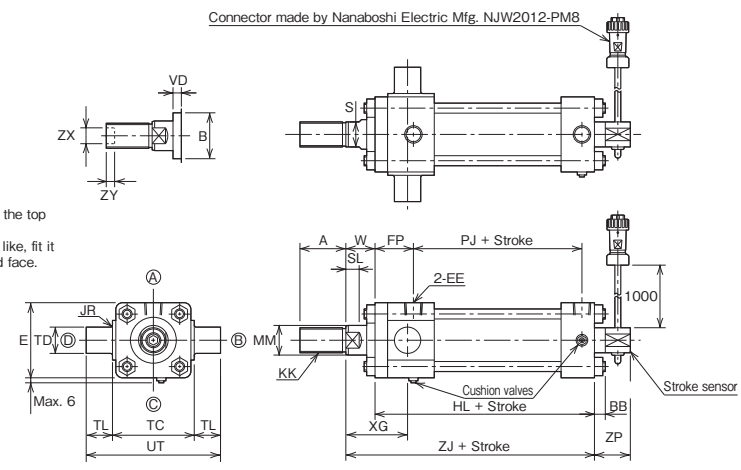
Connector made by Nanaboshi Electric Mfg. NJW2012-PM8

TA

PQCP - NH 1 TA Bore B B Stroke - A B Sensor symbol Sensor quantity

Nominal pressure	Bore	ZX	ZY
5 MPa	φ50		
	φ63	φ19	10
7 MPa	φ80		
	φ100	φ25	20
14 MPa	φ50		
	φ63	φ19	10
	φ80		
	φ100	φ25	20

The stroke sensor is internal in the top of piston rod.
When using a spring pin or the like, fit it in the range of ZY from the end face.



Connector made by Nanaboshi Electric Mfg. NJW2012-PM8

Dimensional table/FY·FE

Nominal pressure	Output	Bore	Rod type	A	B	KK	MM	S	SL	VD	E
5 MPa	10kN	φ50	B type	45	φ46	M24×1.5	φ28	24	14	10	□76
	20kN	φ63		55	φ55	M30×1.5	φ35.5	30	16	10	□90
7 MPa	35kN	φ80		70	φ65	M39×1.5	φ45	41	20	10	□110
	50kN	φ100		85	φ80	M48×1.5	φ56	50	23	10	□135
14 MPa	25kN	φ50	A type	55	φ50	M30×1.5	φ35.5	30	16	17	□76
	40kN	φ63	B type	55	φ55	M30×1.5	φ35.5	30	16	10	□90
	70kN	φ80		70	φ65	M39×1.5	φ45	41	20	10	□110
	100kN	φ100		85	φ80	M48×1.5	φ56	50	23	10	□135

Nominal pressure	EE	FY	FB	FE	LY	LL	PJ	R	TF	UF	W	YP	ZP
5 MPa	Rc1/2	18	φ14	85	160	142	98	58	115	145	30	29	43
	Rc1/2	20	φ18	98	168	148	102	65	132	165	35	31	43
7 MPa	Rc3/4	24	φ18	118	190	166	110	87	155	190	35	38	43
	Rc3/4	28	φ22	150	213	185	116	109	190	230	40	38	30
14 MPa	Rc1/2	20	φ14	85	162	142	98	58	115	145	41	29	43
	Rc1/2	20	φ18	98	168	148	102	65	132	165	35	31	43
	Rc3/4	24	φ18	118	190	166	110	87	155	190	35	38	43
	Rc3/4	28	φ22	150	213	185	116	109	190	230	40	38	30

Dimensional table/TA

Nominal pressure	Output	Bore	Rod type	A	B	KK	MM	S	SL	VD	BB	E
5 MPa	10kN	φ50	B type	45	φ46	M24×1.5	φ28	24	14	10	11	□76
	20kN	φ63		55	φ55	M30×1.5	φ35.5	30	16	10	13	□90
7 MPa	35kN	φ80		70	φ65	M39×1.5	φ45	41	20	10	16	□110
	50kN	φ100		85	φ80	M48×1.5	φ56	50	23	10	18	□135
14 MPa	25kN	φ50	A type	55	φ50	M30×1.5	φ35.5	30	16	17	11	□76
	40kN	φ63	B type	55	φ55	M30×1.5	φ35.5	30	16	10	13	□90
	70kN	φ80		70	φ65	M39×1.5	φ45	41	20	10	16	□110
	100kN	φ100		85	φ80	M48×1.5	φ56	50	23	10	18	□135

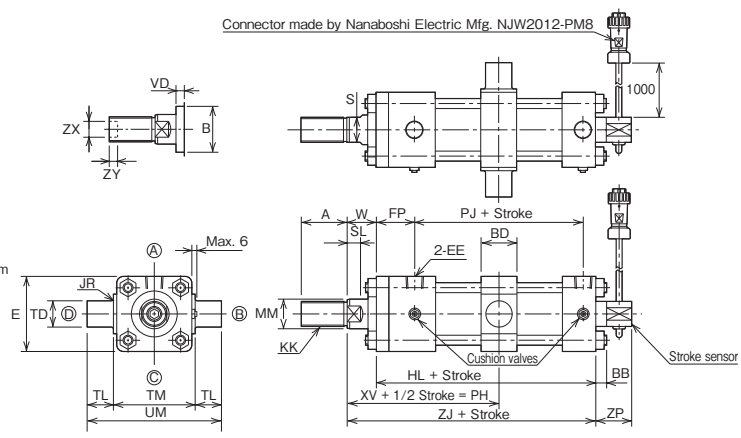
Nominal pressure	EE	FP	HL	JR	PJ	TC	TD	TL	UT	W	XG	ZJ	ZP
5 MPa	Rc1/2	42	155	R2.5	98	85 ⁰ _{0.35}	φ25e9	25	135	30	66	185	43
	Rc1/2	46	163	R2.5	102	98 ⁰ _{0.35}	φ31.5e9	31.5	161	35	74	198	43
7 MPa	Rc3/4	56	184	R2.5	110	118 ⁰ _{0.35}	φ31.5e9	31.5	181	35	82	219	43
	Rc3/4	58	205	R3	116	145 ⁰ _{0.4}	φ40e9	40	225	40	89	245	30
14 MPa	Rc1/2	42	155	R2.5	98	85 ⁰ _{0.35}	φ25e9	25	135	41	77	196	43
	Rc1/2	46	163	R2.5	102	98 ⁰ _{0.35}	φ31.5e9	31.5	161	35	74	198	43
	Rc3/4	56	184	R2.5	110	118 ⁰ _{0.35}	φ31.5e9	31.5	181	35	82	219	43
	Rc3/4	58	205	R3	116	145 ⁰ _{0.4}	φ40e9	40	225	40	89	245	30

TC

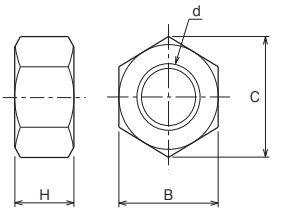
PQCP - NH 1 TC Bore B B Stroke - A B Sensor symbol Sensor quantity

Nominal pressure	Bore	ZX	ZY
5 MPa	φ50		
	φ63	φ19	10
7 MPa	φ80		
	φ100	φ25	20
14 MPa	φ50		
	φ63	φ19	10
	φ80		
	φ100	φ25	20

The stroke sensor is internal in the top of piston rod. When using a spring pin or the like, fit it in the range of ZY from the end face.



Lock nut



Dimensional table/TC

Nominal pressure	Output	Bore	Rod type	A	B	KK	MM	S	SL	VD	BB	BD	E	
5 MPa	10kN	φ50	B type	45	φ46	M24×1.5	φ28	24	14	10	11	33	□76	
	20kN	φ63		55	φ55	M30×1.5	φ35.5	30	16	10	13	43	□90	
7 MPa	35kN	φ80		70	φ65	M39×1.5	φ45	41	20	10	16	43	□110	
	50kN	φ100		85	φ80	M48×1.5	φ56	50	23	10	18	53	□135	
14 MPa	25kN	φ50		A type	55	φ50	M30×1.5	φ35.5	30	16	17	11	33	□76
	40kN	φ63		B type	55	φ55	M30×1.5	φ35.5	30	16	10	13	43	□90
	70kN	φ80	70		φ65	M39×1.5	φ45	41	20	10	16	43	□110	
	100kN	φ100	85		φ80	M48×1.5	φ56	50	23	10	18	53	□135	

Nominal pressure	EE	FP	HL	JR	Min. PH	PJ	TD	TL	TM	UM	W	XV	ZJ	ZP
5 MPa	Rc1/2	42	155	R2.5	113.5	98	φ25e9	25	85 ^{0.35} ₀	135	30	121	185	43
	Rc3/4	46	163	R2.5	127.5	102	φ31.5e9	31.5	98 ^{0.35} ₀	161	35	132	198	43
7 MPa	Rc3/4	56	184	R2.5	140.5	110	φ31.5e9	31.5	118 ^{0.35} ₀	181	35	146	219	43
	Rc3/4	58	205	R3	152.5	116	φ40e9	40	145 ^{0.4} ₀	225	40	156	245	30
14 MPa	Rc1/2	42	155	R2.5	124.5	98	φ25e9	25	85 ^{0.35} ₀	135	41	132	196	43
	Rc1/2	46	163	R2.5	127.5	102	φ31.5e9	31.5	98 ^{0.35} ₀	161	35	132	198	43
	Rc3/4	56	184	R2.5	140.5	110	φ31.5e9	31.5	118 ^{0.35} ₀	181	35	146	219	43
	Rc3/4	58	205	R3	152.5	116	φ40e9	40	145 ^{0.4} ₀	225	40	156	245	30

Dimensional table/Lock nut

Symbol	Part number	Rod B				Rod A				
		B	C	d	H	Part number	B	C	d	H
φ50	LNH-24F-H	32	37.0	M24×1.5	14	LNH-30F-H	41	47.3	M30×1.5	17
φ63	LNH-30F-H	41	47.3	M30×1.5	17	-	-	-	-	-
φ80	LNH-39F-H	55	63.5	M39×1.5	20	-	-	-	-	-
φ100	LNH-48F-H	70	80.8	M48×1.5	26	-	-	-	-	-

CAUTION

Cautions for use

- ①If the cylinder unit must be disassembled for maintenance, please contact us.
- ②The stroke sensor is internal in the top of piston rod. When using a spring pin or the like, fit it in the range of ZY from the end face.
- ③The position sensing system does not have a positioning function.