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Pretensioning Elements

Type 9420A01 ... 9420A71

Set of Pretensioning Elements for Load Washers

The standardized pretensioning elements are used for mounting the force load washers Types 9001A ... 9071A and torque load washers Types 9039 ... 9069.

- Elastic pretension screw, optimized for tension and compression force measurement
- Low force shunt
- Ground-isolated mounting warranted

Description

A Set of pretensioning elements consists of a pretensioning bolt (PB, high strength, stainless steel of the mold), a centring sleeve (CS), two insulating washers (IW) and a hexagon nut (HN). These accessories are separately available on request.

Application

Pretensioning of load washers and torque sensors for optimized introduction of force; ground insulated mounting.

Mounting

Pretensioned load washers can measure both tensile and compression forces. The pretension needed is also governed by the anticipated lateral forces which produce a bending moment. For details see instruction manual 9001A_002-032.
The pretension bolt is screwed into the base plate and the thread secured with adhesive (e.g. Loctite® 121™). The sensor is centered using the centering sleeve.
Before assembly, the contact surfaces of the base and cover plates as well as on the sensor must be carefully cleaned with a degreasing cleaning agent.

The two insulating washers allow ground-insulated mounting. Before screwing in the pretension nut, the contact surface and the threads of the pretension bolt should be greased with special grease Type 1063.
Load washers Type 9039/49/69 will be pretensioned with a defined torque.
When the load washers Type 9001A ... 9071A are connected to the charge amplifier, the pretension force can be measured directly as the pretension nut is tightened. Pretensioning of the load washer produces a force shunt. To measure the sensitivity of the pretensioned sensor, recalibration is necessary.

Technical Data

Type		**9420A01**	**9420A11**	**9420A21**	**9420A31**
for sensor	Type	9001A	9011A	9021A	9031A/ 9039
Inner ø sensor	mm	4,1	6,5	10,5	13
Pretension bolt Thread		M4x0,5	M5x0,5	M8x1	M10x1
L, length	mm	22	28	40	46
Pretension force	kN	4	7	18	30/15 [2]
Shunt	%	≈10	≈7	≈8	≈9

Type		**9420A41**	**9420A51**	**9420A61**	**9420A71**
for sensor	Type	9041A/ 9049	9051A	9061A/ 9069	9071A
Inner ø sensor	mm	17	21	26,5	40,5
Pretension bolt Thread		M12x1	M14x1,5	M20x1,5	M27x2
L, length	mm	60	62	80	102
Pretension force	kN	45/25 [2]	60	100/120 [2]	200
Shunt	%	≈8	≈7	≈7	≈7

Recommended materials for environment of sensor (e.g. cover and base plate, Fig. 5) Quenched and drawn

W.-Nr.	1.4045 [1]	1.4021 [1]	1.1191
DIN	x22CrNi17	x20Cr13	Ck45
AFNOR	Z15CN16-02	Z20C13	xC45
B.S.	431S29	420S37	M46
JIS	SUS431	SUS420J1	S45C
AISI/SAE	431	420	1045

[1] rust-resistant
[2] Pretensioning force see data sheet 9039_000-111

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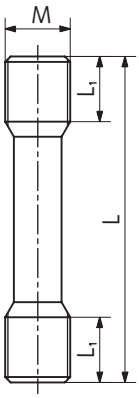
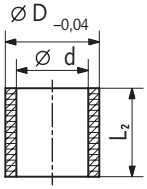
Overview Set Components

Pretensioning Set Type	for Sensor Type	consisting of			
		PB Type	CS Type	IW Type	HN Type
9420A01	**9001A**	9502	9504	9508	9506
9420A11	**9011A**	9512	9514	9518	9516
9420A21	**9021A**	9522	9524	9528	9526
9420A31	**9031A/9039**	9532	9534	9538	9536
9420A41	**9041A/9049**	9542	9544	9548	9546
9420A51	**9051A**	9552	9554	9558	9556
9420A61	**9061A/9069**	9562	9564	9568	9566
9420A71	**9071A**	9572	9574	9578	9576



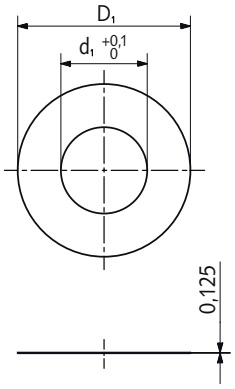
Type	H	M	L	L_1
9502	6,5	M4x0,5	22	4
9512	8	M5x0,5	28	5
9522	10	M8x1	40	8
9532	11	M10x1	46	10
9542	12	M12x1	60	12
9552	13	M14x1,5	62	13
9562	15	M20x1,5	80	19
9572	17	M27x2	102	26

Fig. 1: Pretensioning bolt **PB**



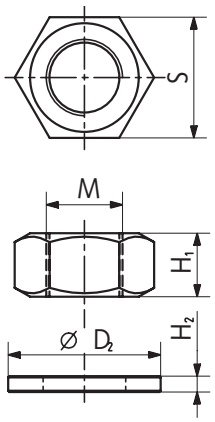
Type	D	d	L_2
9504	4,1	3,0	10,5
9514	6,5	4,0	12
9524	10,5	8,5	14
9534	13	11	15
9544	17	13	16
9554	21	17	17
9564	26,5	22,5	19
9574	40,5	36,5	21

Fig. 2: Centering sleeve **CS**



Type	D_1	d_1
9508	10,4	4,1
9518	14,4	6,5
9528	22	10,5
9538	28	13
9548	34	17
9558	39,6	21
9568	51,6	26,5
9578	75	40,5

Fig. 3: Insulating washer **IS**



Type	H_1	S	D_2	H_2
9506	3,2	7	9	0,8
9516	4	8	10	1
9526	6,5	13	16	1,6
9536	8	17	18	1,6
9546	10	19	24	2,5
9556	11	22	28	2,5
9566	16	30	37	3
9576	22	41	50	4

Fig. 4: Hexagon a nut (incl. washer) **HN**

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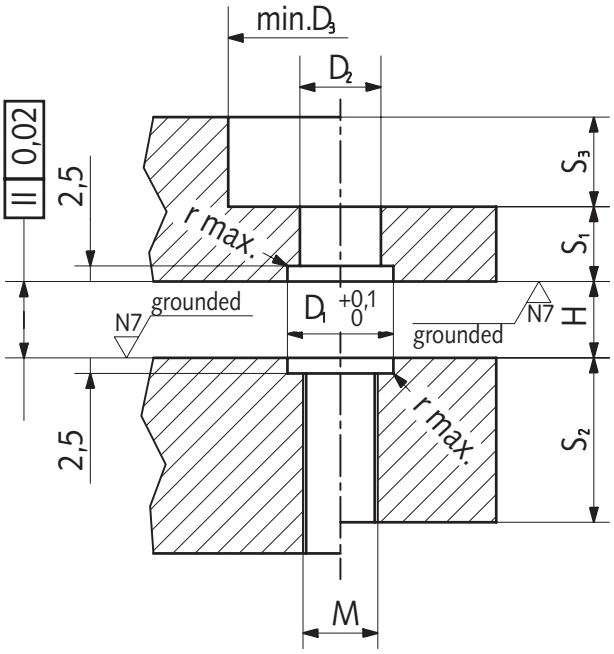

Fig 5: Preparing the mounting surfaces and the bores in the base and cover plates, recommended material see page 1
(Limit of elasticity R_e > 500 N/mm^2)

Mounting Dimensions

Set Type	Dimensions							
	M	D_1	D_2	D_3	S_1	S_2	S_3	H
9420A01	M4x0,5	4,1	4,1	12	3,5	10	6	6,5
9420A11	M5x0,5	6,5	5,1	15	5,5	12	7	8
9420A21	M8x1	10,5	8,1	20	8	17	11	10
9420A31	M10x1	13	10,2	26	10	20	12	11
9420A41	M12x1	17	12,2	28	13	25	15	12
9420A51	M14x1,5	21	14,2	33	16	25	16	13
9420A61	M20x1,5	26,5	20,2	42	19	32	22	15
9420A71	M27x2	40,5	27,3	58	30	35	29	17

Ordering Key

Type 9420A ☐

for sensor Type 9001A	**01**
for sensor Type 9011A	**11**
for sensor Type 9021A	**21**
for sensor Type 9031A/9039	**31**
for sensor Type 9041A/9049	**41**
for sensor Type 9051A	**51**
for sensor Type 9061A/9069	**61**
for sensor Type 9071A	**71**

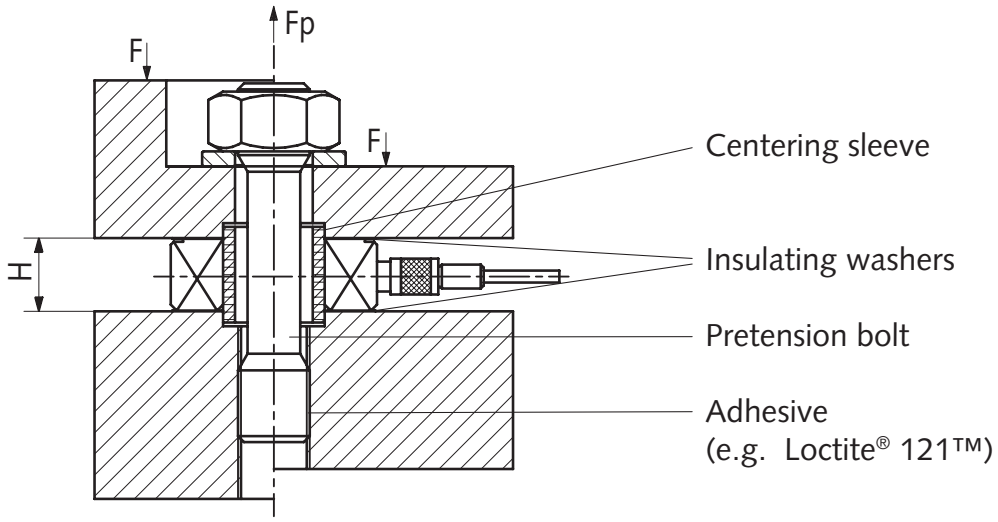

Fig. 6: Mounting example

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