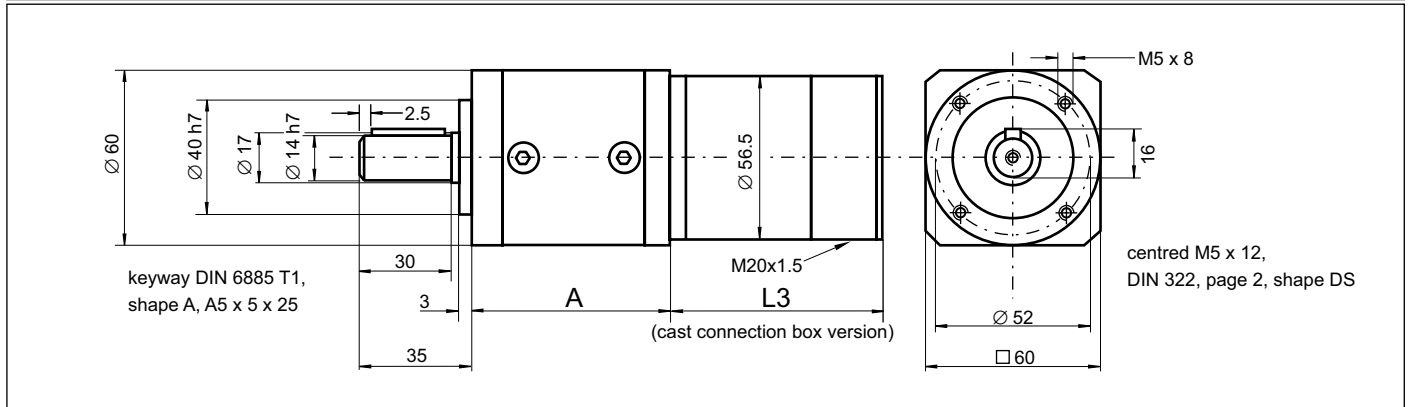


Stepping motor with planetary gear head series SM 56 PE **29**

degree of protection: IP54 torque shaft bearing: ball bearing max. axial load: 600 N based on the center of the output shaft max. radial load: 500 N lubrication: life time lubrication operating temperature: -25°C/+90°C mounting position: any	motor type	length L3 ± 1 mm	inertia kgcm ²
	SM 56.1.18	76	0.125
	SM 56.2.18	102	0.25
	SM 56.3.18	130	0.375



planetary gear head series PE											
type	ratio	max. torque output Nm			inertia referred to motor shaft 10 ⁻² kgcm ²	stiffness of distortion Nm/arcmin	absolute backlash angular minutes	efficiency approx. %	length A mm	weight without motor kg	number of stages
		SM 56.1	SM 56.2	SM 56.3							
PE3	3	1.1	2	3.2	2.3	<20	96	55	0.65	1	
PE4	4	1.5	2.7	4.3							
PE5	5	1.9	3.8	5.4							
PE8	8	3.1	5.4	8.6							
PE9	9	3.3	5.7	9.2	2.5	<25	94	67	0.82	2	
PE12	12	4.4	7.7	12.2							
PE15	15	5.5	9.6	15.3							
PE16	16	5.7	10.2	16.3							
PE20	20	7.3	12.8	20.4							
PE25	25	9.1	15.9	25.5							
PE32	32	11.7	20.4	32.6							
PE40	40	14.6	25.5	40							
PE64	64	18	18	18	2.5	<30	90	80	1	3	
PE60	60	20.6	36	44							
PE80	80	27.5	44	44							
PE100	100	34.4	44	44							
PE120	120	41.3	44	44							
PE160	160	44	44	44							
PE200	200	40	40	40							
PE256	256	44	44	44							
PE320	320	40	40	40							
PE512	512	18	18	18	0.1						

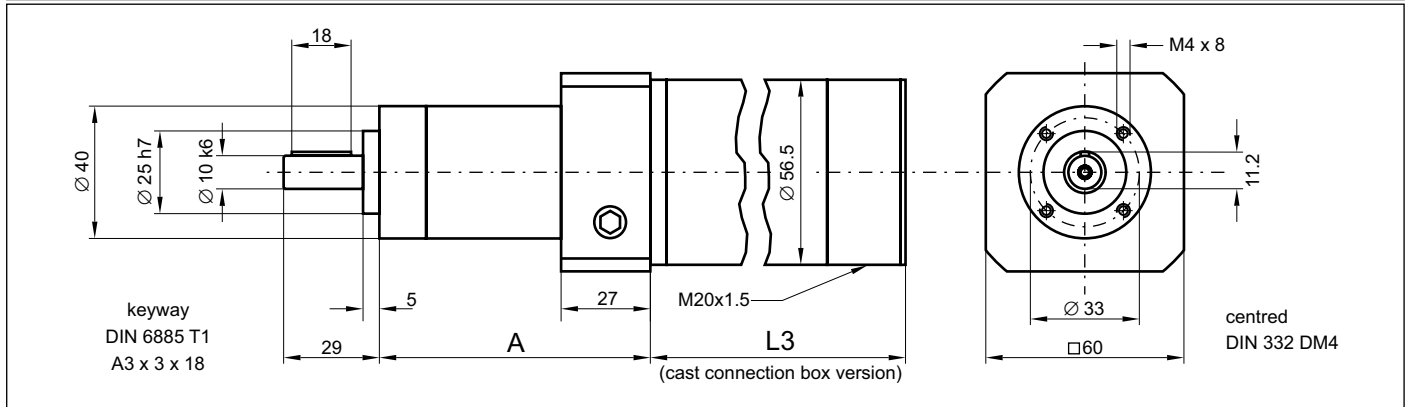
ordering indication: (example) SM 56.2.18J3 PE8

bold faced types: preferential versions (on stock)

output torques are limited by the nominal output torque of the gear heads

30 Stepping motor with planetary gear head series SM 56 PRA

degree of protection: IP64 torque shaft bearing: ball bearing max. axial load: 330 N based on the center of the output shaft max. radial load: 220 N lubrication: life time lubrication operating temperature: -25°C to +90°C (short time +120°C) mounting position: any	motor type	length L3 ± 1 mm	inertia (without gear head) kgcm ²
	SM 56.1.18	76	0.125
	SM 56.2.18	102	0.25
	SM 56.3.18	130	0.375



planetary gear head series PRA											
type	ratio	max. torque output Nm			inertia referred to motor shaft 10 ⁻² kgcm ²	stiffnes of distortion Nm/arcmin	absolute backlash angular minutes	efficiency approx. %	length A mm	weight without motor kg	number of stages
		SM 56.1	SM 56.2	SM 56.3							
PRA4	4	1.5	2.7	4	0.4	<20	96	66	0.3	1	
PRA5	5	1.9	3.8	4.5							
PRA7	7	2.7	4.5	4.5							
PRA9	9	3.4	4	4							
PRA16	16	5			0.060	0.5	<25	94	82	0.4	2
PRA20	20				0.058						
PRA25	25				0.058						
PRA28	28				0.058						
PRA35	35				0.057						
PRA49	49				0.057						
PRA64	64	5			0.03	0.6	<30	90	93	0.5	3
PRA80	80				0.03						
PRA100	100				0.03						
PRA140	140				0.03						
PRA175	175				0.03						
PRA245	245				0.03						
PRA343	343				0.03						
PRA729	729				0.03						

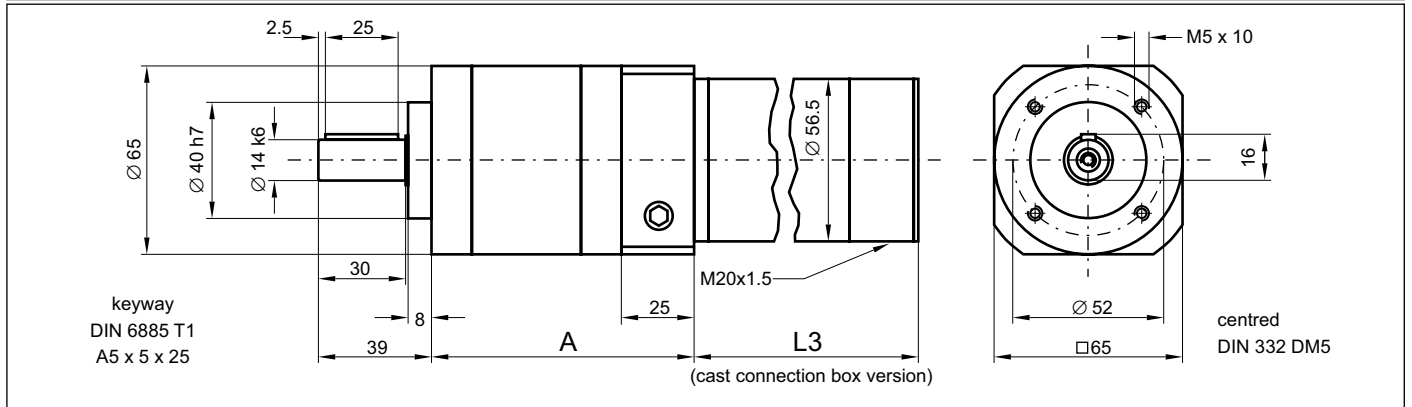
ordering indication: (example) SM 56.2.18 M3 PRA20

bold faced types: preferential versions (on stock)

output torques are limited by the nominal output torque of the gear heads

Stepping motor with planetary gear head series SM 56 PR **31**

degree of protection: IP64 torque shaft bearing: ball bearing max. axial load: 1080 N based on the center of the output shaft max. radial load: 930 N lubrication: life time lubrication operating temperature: -25°C to +90°C (short time +120°C) mounting position: any	motor type	length L3 ± 1 mm	inertia (without gear head) kgcm ²
	SM 56.1.18	76	0.125
	SM 56.2.18	102	0.25
	SM 56.3.18	130	0.375



planetary gear head series PR											
type	ratio	max. torque output Nm			inertia referred to motor shaft 10 ⁻² kgcm ²	stiffnes of distortion Nm/arcmin	absolute backlash angular minutes	efficiency approx. %	length A mm	weight without motor kg	number of stages
		SM 56.1	SM 56.2	SM 56.3							
PR3	3	1.1	2	3.2	1.6	12	97	90.5	1.3	1	
PR4	4	1.5	2.7	4.3							
PR5	5	1.9	3.8	5.4							
PR7	7	2.7	5.3	7.6							
PR10	10	3.8	7.6	10.8							
PR16	16	5.7	10.2	16.3	2	15	94	114.5	1.7	2	
PR20	20	7.3	12.8	19							
PR25	25	9.1	15.9	21							
PR28	28	10.2	17.8	21							
PR35	35	12.7	21	21							
PR40	40	14.6	21	21							
PR50	50	18.2	21	21							
PR70	70	17	17	17	2.1	20	90	132	2	3	
PR100	100	16	16	16							
PR120	120	21	21	21							
PR160	160	21	21	21							
PR200	200	21	21	21							
PR250	250	21	21	21							
PR350	350	21	21	21							
PR500	500	21	21	21							
PR700	700	19	19	19							
PR1000	1000	18	18	18							

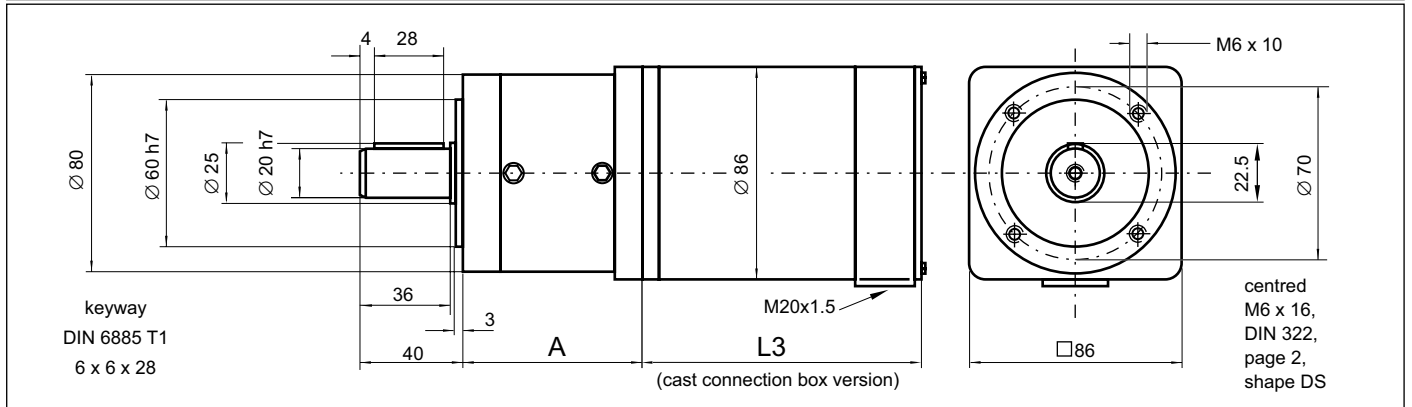
ordering indication: (example) SM 56.2.18 M3 PR10

bold faced types: preferential versions (on stock)

output torques are limited by the nominal output torque of the gear heads

32 Stepping motor with planetary gear head series SM 87 PE / SM 88 PE

degree of protection: IP54 torque shaft bearing: ball bearing max. axial load: 1200 N based on the center of the output shaft max. radial load: 950 N lubrication: life time lubrication operating temperature: -25°C to +90°C mounting position: any	motor type	Length L3 ± 1 mm	inertia (without gear head) kgcm ²
	SM 87.1.18	85.5	0.65
	SM 87.2.18	117.5	1.3
	SM 87.3.18	149.5	1.95
	SM 87.4.18	181.5	2.6
	SM 88.1.18	93.5	1.35
	SM 88.2.18	125.5	2.7
	SM 88.3.18	157.5	4.05
	SM 88.4.18	189.5	5.4



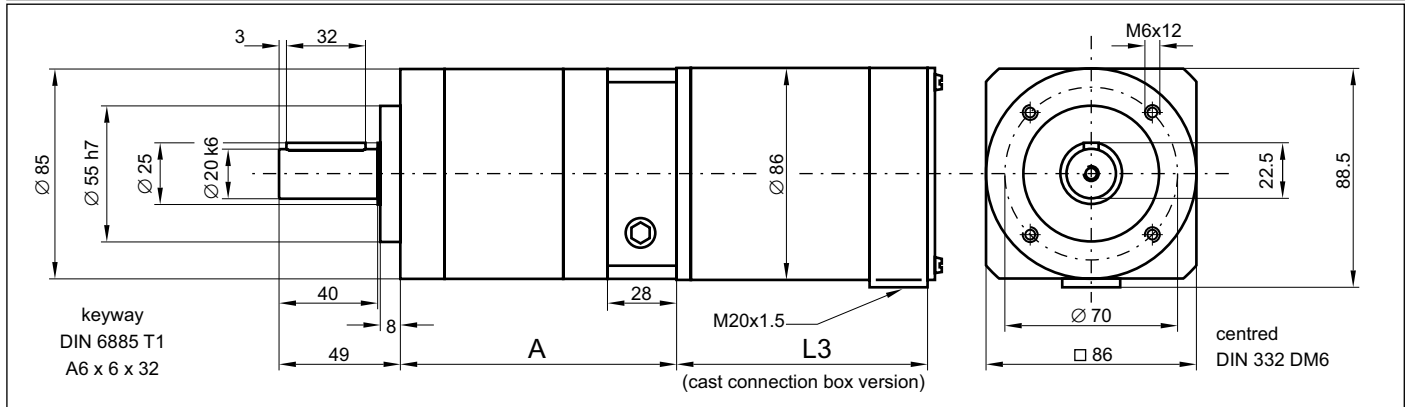
planetary gear head series PE																	
type	ratio	max. torque output Nm								inertia referred to motor shaft 10 ⁻² kgcm ²	stiffness of distortion Nm/arcmin	absolute backlash angular minutes	efficiency approx. %	Length A mm	weight without motor kg	number of stages	
		SM 87.1	SM 88.1	SM 87.2	SM 88.2	SM 87.3	SM 88.3	SM 87.4	SM 88.4								
PE3	3	4.3	7.2	8.6	14.4	12.9	21.6	17.3	28.8	63	6	<12	96	72 (93.5) (at SM 88.4)	1.6	1	
PE4	4	5.8	9.6	11.5	19.2	17.2	28.8	23	38.4	25							
PE5	5	7.2	12	14.4	24	21.6	36	28.8	48	14							
PE8	8	11.5	19.2	23	38.4	34.5	50	46.1	50	8							
PE9	9	12.7	21.1	25.4	42.3	38	63.4	50.7	84.6	63	6.5	<17	94	89 (110.5) (at SM 88.4)	2.2	2	
PE12	12	16.9	28.2	33.8	56.4	50.7	84.6	67.7	112.8	26							
PE15	15	21.2	35.2	42.3	70.5	63.4	105.8	84.6	110	62							
PE16	16	22.6	37.6	45.1	75.2	67.6	112.8	90.2	120	25							
PE20	20	28.2	47	56.4	94	84.6	120	112.8	120	15							
PE25	25	35.3	58.7	70.5	110	105.7	110	110	110	15							
PE32	32	45.1	75.2	90.2	120	120	120	120	120	8							
PE40	40	56.4	94	110	110	110	110	110	110	8							
PE64	64	50	50	50	50	50	50	50	50	6							
PE60	60	81	110	110	110	110	110	110	110	25	6.3	<22	90	106.5 (127) (at SM 88.4)	2.8	3	
PE80	80	108	120	120	120	120	120	120	120	18							
PE100	100	120	120	120	120	120	120	120	120	15							
PE120	120	110	110	110	110	110	110	110	110	60							
PE160	160	120	120	120	120	120	120	120	120	8							
PE200	200	110	110	110	110	110	110	110	110	8							
PE256	256	120	120	120	120	120	120	120	120	8							
PE320	320	110	110	110	110	110	110	110	110	6							
PE512	512	50	50	50	50	50	50	50	50	6							

ordering indication: (example) SM SM 87.1.18 M3 PE8

bold faced types: preferential versions (on stock)
 output torques are limited by the nominal output torque of the gear heads

Stepping motor with planetary gear head series SM 87 PR / SM 88 PR **33**

degree of protection: IP64 torque shaft bearing: ball bearing max. axial load: 2180 N based on the center of the output shaft max. radial load: 1770 N lubrication: life time lubrication operating temperature: -25°C to +90°C (short time +120°C) mounting position: any	motor type	Length L3 ± 1 mm	inertia (without gear head) kgcm ²
	SM 87.1.18	85.5	0.65
	SM 87.2.18	117.5	1.3
	SM 87.3.18	149.5	1.95
	SM 87.4.18	181.5	2.6
	SM 88.1.18	93.5	1.35
	SM 88.2.18	125.5	2.7
	SM 88.3.18	157.5	4.05
	SM 88.4.18	189.5	5.4



planetary gear head series PR																		
type	ratio	max. torque output Nm								inertia referred to motor shaft 10 ⁻² kgcm ²	stiffness of distortion Nm/arcmin	absolute backlash angular minutes	efficiency approx. %	Length A mm	weight without motor kg	number of stages		
		SM 87.1	SM 88.1	SM 87.2	SM 88.2	SM 87.3	SM 88.3	SM 87.4	SM 88.4									
PR3	3	4.3	7.2	8.6	14.4	12.9	21.6	17.3	28.8	1.62	4.8	10	96	112	2.6	1		
PR4	4	5.8	9.6	11.5	19.2	17.2	28.8	23	38.4	1.44								
PR5	5	7.2	12	14.4	24	21.6	36	28.8	48	1.36								
PR7	7	10.1	16.8	20.2	33.6	30.2	43	40.3	43	1.30								
PR10	10	14.4	24	28.8	35	35	35	35	35	1.27								
PR16	16	22.6	37.6	45.1	55	55	55	55	55	1.42	6	15	94	143	3.5	2		
PR20	20	28.2	47	55	55	55	55	55	55	1.35								
PR25	25	35.3	58	58	58	58	58	58	58	1.35								
PR28	28	39.5	55	55	55	55	55	55	55	1.29								
PR35	35	49.5	58	58	58	58	58	58	58	1.29								
PR40	40	55	55	55	55	55	55	55	55	1.26								
PR50	50	58	58	58	58	58	58	58	58	1.26								
PR70	70	50	50	50	50	50	50	50	50	1.26								
PR100	100	35	35	35	35	35	35	35	35	1.20								
PR120	120	55	55	55	55	55	55	55	55	0.34							5.5	20
PR160	160	55	55	55	55	55	55	55	55	0.34								
PR200	200	58	58	58	58	58	58	58	58	0.34								
PR250	250	58	58	58	58	58	58	58	58	0.34								
PR350	350	58	58	58	58	58	58	58	58	0.34								
PR500	500	58	58	58	58	58	58	58	58	0.34								
PR700	700	50	50	50	50	50	50	50	50	0.34								
PR1000	1000	35	35	35	35	35	35	35	35	0.34								

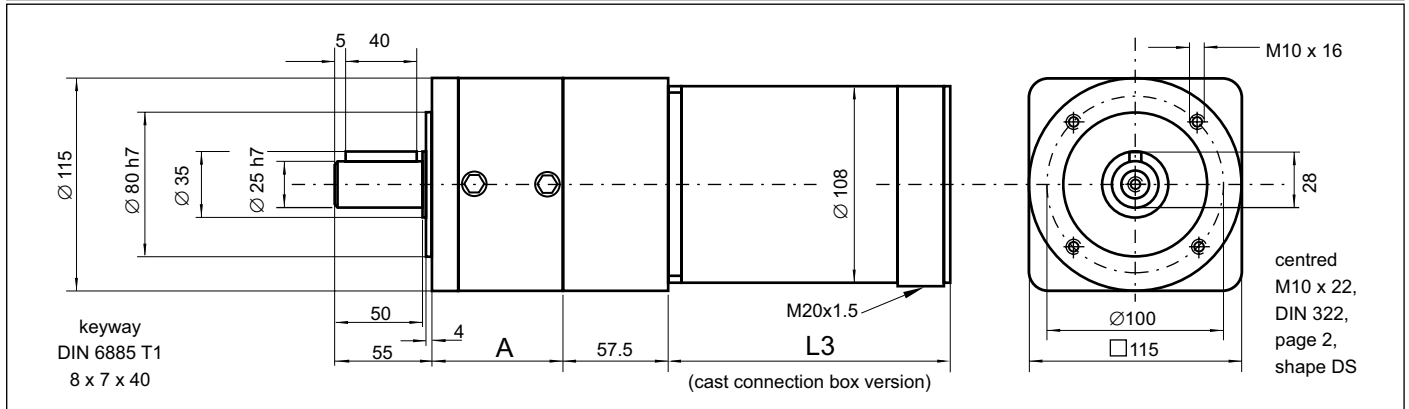
ordering indication: (example) SM SM 87.2.18 M6 PR10

bold faced types: preferential versions (on stock)

output torques are limited by the nominal output torque of the gear heads

34 Stepping motor with planetary gear head series SM 107 PE

degree of protection: IP54 torque shaft bearing: ball bearing max. axial load: 2800 N based on the center of the output shaft max. radial load: 2000 N lubrication: life time lubrication operating temperature: -25°C to +90°C mounting position: any	motor type	Length L3 ± 1 mm	inertia (without gear head) kgcm ²
	SM 107.1.18	111	4
	SM 107.2.18	161	8
	SM 107.3.18	211	12
	SM 107.4.18	261	16



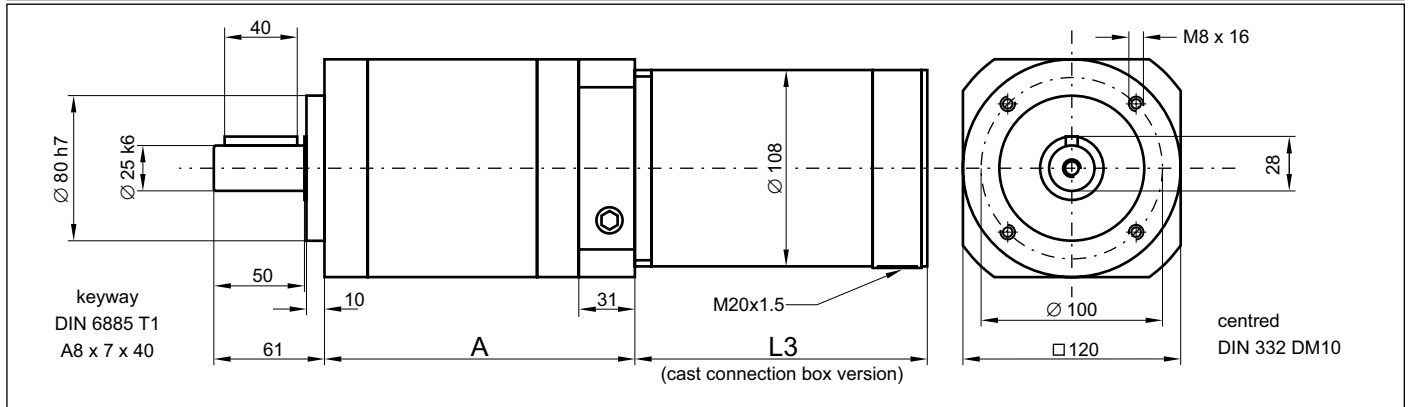
planetary gear head series PE												
type	ratio	max. torque output Nm				inertia referred to motor shaft 10 ⁻² kgcm ²	stiffnes of distortion Nm/arcmin	absolute backlash angular minutes	efficiency approx. %	Length A mm	weight without motor kg	number of stages
		SM 107.1	SM 107.2	SM 107.3	SM 107.4							
PE3	3	10.8	20.8	29.7	39.4	2.6	12	<8	96	74	6.5	1
PE4	4	14.4	27.7	39.6	52.6	1.79						
PE5	5	18	34.7	49.5	65.7	1.53						
PE8	8	28.8	55.4	79.2	105	1.32						
PE9	9	30.6	58.9	84.2	112	2.62	13	<12	94	101	9	2
PE12	12	40.8	78.5	112	149	2.56						
PE15	15	51	98.2	140	186	2.53						
PE16	16	54.4	105	150	198	1.75						
PE20	20	68	131	187	248	1.5						
PE25	25	85	164	230	230	1.49						
PE32	32	109	209	260	260	1.3						
PE40	40	136	230	230	230	1.3						
PE64	64	120	120	120	120	1.3	12	<16	90	128	11.5	3
PE60	60	192	260	260	260	2.57						
PE80	80	256	260	260	260	1.5						
PE100	100	260	260	260	260	1.5						
PE120	120	230	230	230	230	2.5						
PE160	160	260	260	260	260	1.3						
PE200	200	230	230	230	230	1.3						
PE256	256	260	260	260	260	1.3						
PE320	320	230	230	230	230	1.3						
PE512	512	120	120	120	120	1.3						

ordering indication: (example) SM 107.2.18 M12 PE8

bold faced types: preferential versions (on stock)
 output torques are limited by the nominal output torque of the gear heads

Stepping motor with planetary gear head series SM 107 PR **35**

degree of protection: IP64 torque shaft bearing: ball bearing max. axial load: 3730 N based on the center of the output shaft max. radial load: 3000 N lubrication: life time lubrication operating temperature: -25°C to +90°C (short time +120°C) mounting position: any	motor type	Length L3 ± 1	inertia (without gear head)
		mm	kgcm ²
	SM 107.1.18	111	4
	SM 107.2.18	161	8
	SM 107.3.18	211	12
	SM 107.4.18	261	16



planetary gear head series PR												
type	ratio	max. torque output Nm				inertia referred to motor shaft 10 ⁻² kgcm ²	stiffness of distortion Nm/arcmin	absolute backlash angular minutes	efficiency approx. %	Length A mm	weight without motor kg	number of stages
		SM 107.1	SM 107.2	SM 107.3	SM 107.4							
PR3	3	10.8	20.8	29.7	39.4	10	10	96	135	6	1	
PR4	4	14.4	27.7	39.6	52.6							
PR5	5	18	34.7	49.5	65.7							
PR7	7	25.5	48.6	69.3	90							
PR10	10	36	69.4	80	80							
PR16	16	54.4	100	100	100	13	15	94	171	8.6	2	
PR20	20	68	100	100	100							
PR25	25	85	110	110	110							
PR28	28	95.2	100	100	100							
PR35	35	110	110	110	110							
PR40	40	100	100	100	100							
PR50	50	110	110	110	110							
PR70	70	95	95	95	95							
PR100	100	85	85	85	85							
PR120	120	100	100	100	100							
PR160	160	100	100	100	100	12	20	90	195	10	3	
PR200	200	100	100	100	100							
PR250	250	110	110	110	110							
PR350	350	110	110	110	110							
PR500	500	110	110	110	110							
PR700	700	95	95	95	95							
PR1000	1000	70	70	70	70							

ordering indication: (example) SM 107.2.18 M12 PR10

bold faced types: preferential versions (on stock)
 output torques are limited by the nominal output torque of the gear heads