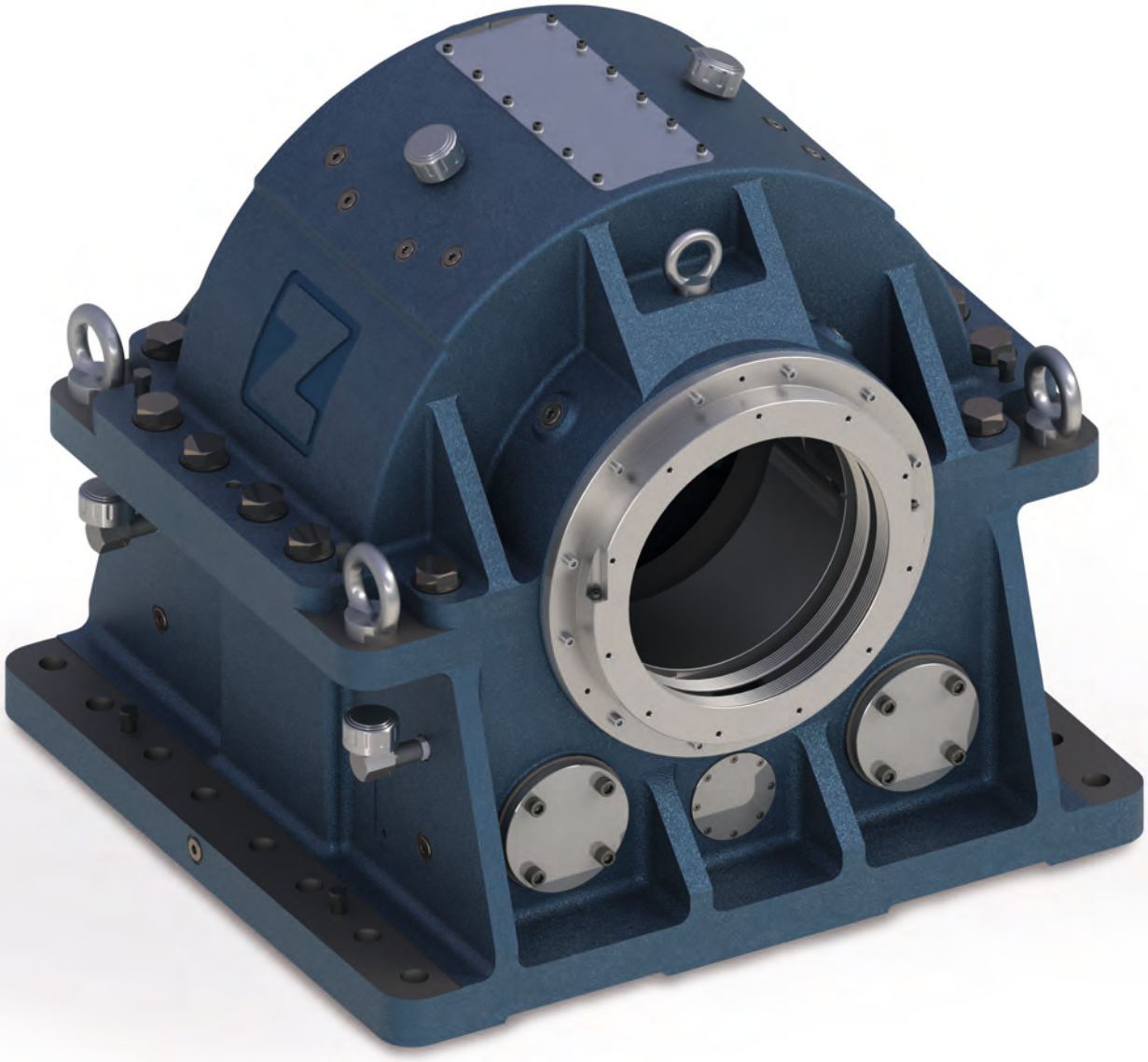
Innovation in Motion

Miba Industrial Bearings
ZT Thrust and Guide Bearing



Miba Industrial Bearings

The Industrial Bearing Branch of the Miba Bearing Group produces hydrodynamic bearings and labyrinth seals for use in mechanical and plant engineering which are used in a wide range of high-performance applications.
Our highly inspired teams, work diligently to serve our customers the best bearing solutions for each and every application.

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Description of the pedestal bearing

Miba ZT thrust bearings were designed to support high thrust loads. The modern design and high-performance standards ensure great effectiveness in the most diverse high-demand applications.

They are based on state of the art technology as well as structural studies and analyses, which guarantee their design reliability.

Housing
The extremely resistant housings are made of nodular cast iron EN-GJS-400-15 (formerly GGG 40), thus provide high mechanical resistance, excellent heat dissipation capacity, high structural strength, and low vibration levels. They can withstand very cold ambient temperatures.

Thread holes for monitoring the temperature, for oil inlets and outlets, as well as for oil level, are provided on both sides of the housing as standard. The housing comes with an oil sight glass on one side.

In the top half of the housing, there is a sight glass, which allows an oil scraper inspection. The basic design can be easily amended, if required, to incorporate, vibration detectors (angled at 45°), horizontal, vertical and axial vibration sensors, thermometers, etc.

Bearing shells and thrust faces
The bearing shells have a cylindrical profile inner diameter, are supplied in halves and housed in the bearing housing. The material is low carbon steel, lined with high tin-based white metal. This construction ensures an easy assembly and a long lifetime.
When the specific load during the start-up is too high, or for very slow speed applications, a hydrostatic jacking system can be integrated.

The ZT bearing thrust part is composed of oscillating trapezoid-shaped pads, ensuring a large thrust load capacity.

Technical Features

Housing casted in GGG40.

Tilting thrust trapezoid-shaped pads.

Oil input exclusive for thrust pads.

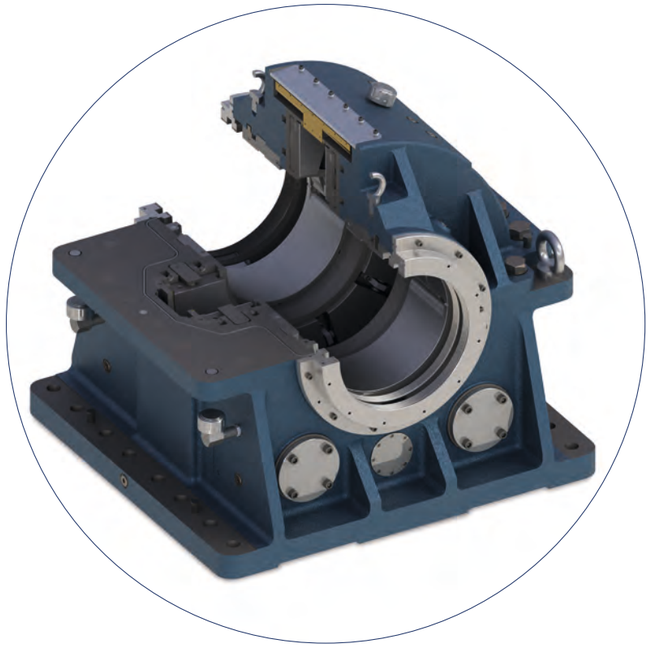
Oil input exclusive for each of the two radial bushings. Connection on either side of the housing (symmetrical bearing).

Oil scraper with the oil conduction function for the bearing thrust parts.

Hydrostatic system if required.

Independent oscillation for thrust pads.

Thrust tilting pads ring (with the possibility of replacement when worn).



Oil supply
The bearing has been designed for an external oil circulation. If the lubricant supply fails, the thrust collar of the shaft delivers the lubricant from the oil sump to the oil scraper. The oil scraper delivers the oil to the radial and thrust parts. This system can be used to permit an emergency shutdown without damage in case an oil system failure occurs.
The ZT bearings have an exclusive oil input for thrust pads and for each part of the two radial shells.

Sealing
The seals are selected according to the different operation conditions, environments and requested protection level. The sealing developed for the ZT bearing consists of rigid aluminum seals (IP 44), (two per bearing). Special seals offering higher protection, or pressurized seals etc., can be supplied for special applications upon request.

Temperature control
Provisions for the fitting of thermo sensors in the journal bush, thrust pads and oil sump are provided as standard. The type of sensor to be used depends on the type required by the readout equipment used (direct reading, centralized control system, recording instrument, etc.). Two different and independent thermo sensors can be adjusted. There is provision for thermometers, radial and thrust part oil inlets and an oil outlet.

Selection of oil
It is recommended that any branded mineral oil which is inhibited against foaming, ageing and oxidation is used as lubricant. The viscosity is suggested by Miba Industrial Bearings if the customer doesn`t have preferences.

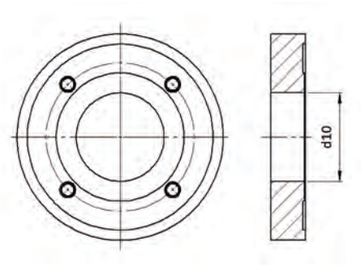
Bearing calculation
Miba Industrial Bearings uses a state of the art calculation program which can provide the following outputs:

- Minimum oil film thickness
- Maximum hydrodynamic pressure
- Maximum bearing temperature
- Oil outlet temperature
- Minimum permissible oil flow
- Frictional power loss
- Stiffness and damping coefficients
- Clearance for bearing / shaft seat

Oil flow

ZT bearings are supplied without oil inlet or outlet flanges. Under request, as additional items, Miba Industrial Bearings can supply these flanges according to DIN 2573 or ANSI B16.5 norms. The ZT bearings have four oil outlets as standard. Two at front of the bearing and two oil outlets at the back that can be used to increase the maximum oil flow of the project.

Larger oil quantities with special outlets on request.



1 // Oil flow

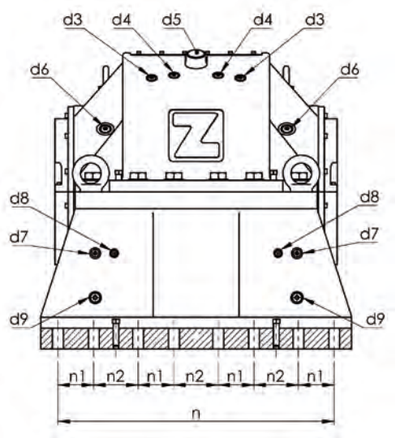
Size	Standard Oil outlet	Maximum flow for oil ISO VG 32 and 46 at 40°C (l/min)	Maximum flow for oil ISO VG 68 and 100 at 40°C (l/min)	Maximum oil outlet by using both sides	Maximum flow for oil ISO VG 32 and 46 at 40°C (l/min)	Maximum flow for oil ISO VG 68 and 100 at 40°C (l/min)
40	2 x G3 (DN 80)	84	78	4 x G3 (DN 80)	168	168
45	2 x G3 (DN 80)	84	78	4 x G3 (DN 80)	168	168
50	2 x G5 (DN 125)	220	210	4 x G5 (DN 125)	440	440
55	2 x G5 (DN 125)	220	210	4 x G5 (DN 125)	440	440

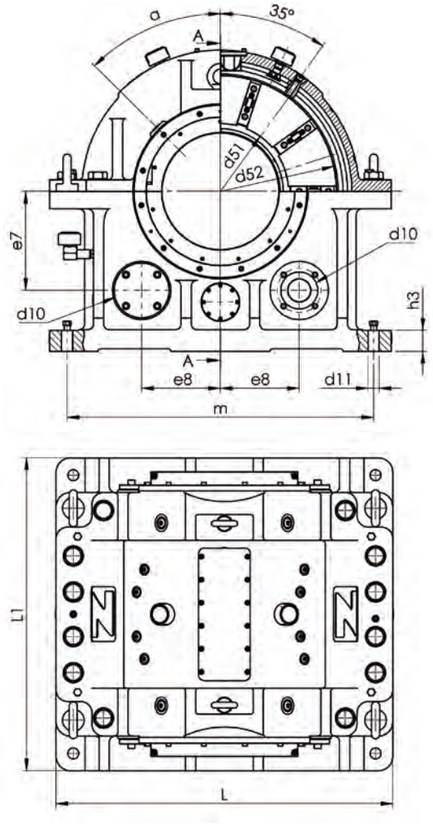
* nonstandard enlarged oil outlet threads for bigger oil quantity applications, upon request. Additional cost will be applied.

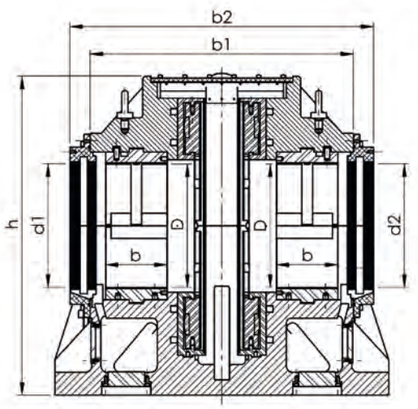
ZT bearing dimensions

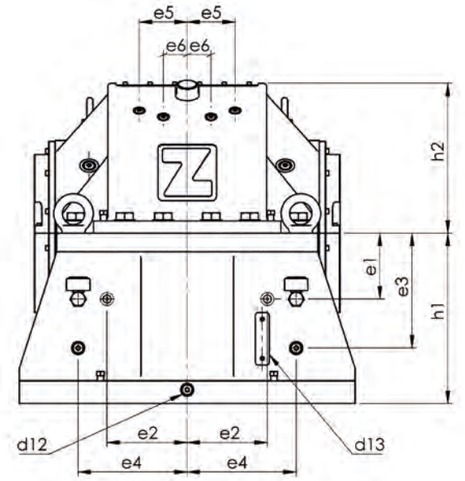
1 // ZT bearing dimensions

Size	D (H7)	a	b	b1	b2	d1	d2	d3	d10	d11	d13	d51	d52	e1	e2	e3		e4	e5	e6	e7	e8	h	h1	h2	h3	L	L1	m	n	n1	n2	appr. weight (kg)
40	400	45°	200	855	987	400	400	G½ (4x)	G3 (4x)	38	G½ (2x)	465	795	215	277.5	370		352,5	155	77	340	270	1035	550	485	73	1170	1085	1050	965	125	155	3200
45	450	35°	225	1060	1162	450	450	G¾ (4x)	G3 (4x)	47	G¾ (2x)	525	990	245	332.5	465		424	380	195	455	265	1315	655	660	90	1600	1400	1440	1240	160	200	7300
50	500	40°	250	1250	1382	500	500	G¾ (4x)	G5 (4x)	52	G1 (2x)	585	1080	270	423.5	580		513,5	471	261	500	370	1550	800	750	90	1880	1500	1590	1300	175	200	12500
55	550	45°	275	1320	1450	550	550	G1 (4x)	G5 (4x)	58	G1 (2x)	700	1200	320	400	600		227	560	-	500	430	1610	870	740	118	1900	1600	1736	1400	200	200	10500









d3 = Thrust bearing oil inlets- G1/2" (4x)
d4 = Thrust pads thermo sensors
d5 = Breath (air filter)
d6 = Radial bearing oil inlets- G3/4" (4x)
d7 = Radial thermo sensors- G1/2" (4x)
d8 = Hydrostatic oil inlets- G1/4" (4x) or breath.
d9 = Local Thermometer- G3/4" (4x)
Oil sight glass
d10 = Oil outlet- According to: ANSI or DIN standards.
d11 = Fastening holes
d12 = Oil drain
d13 = Oil sight glass

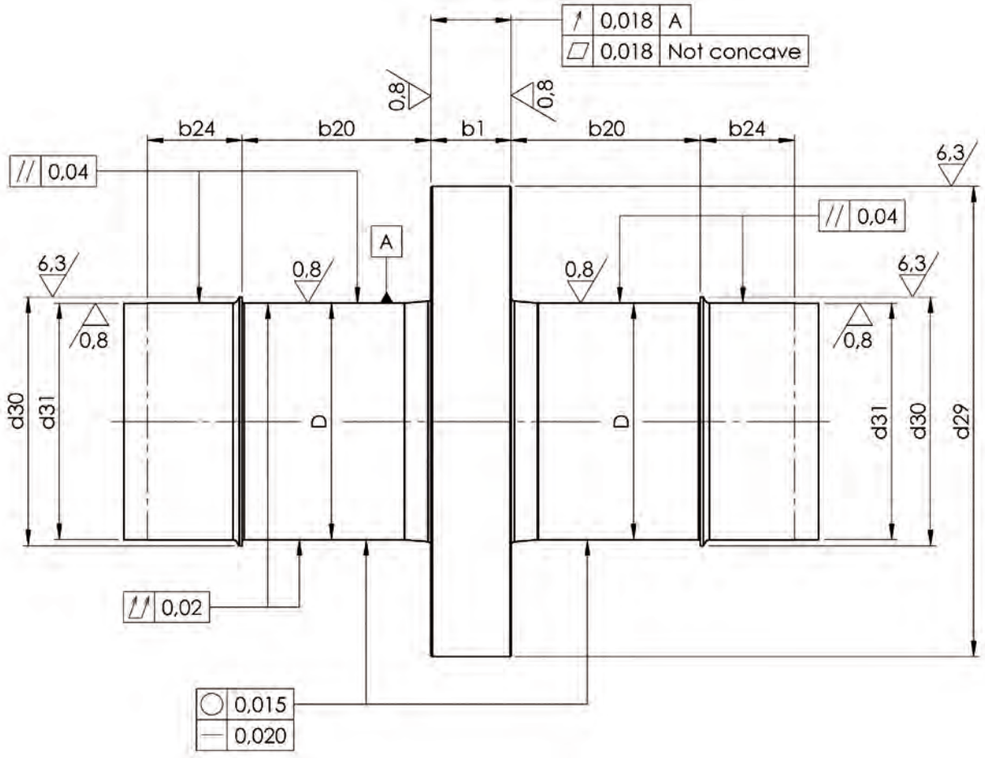
Drawings shown here are for reference only. Some fin details, for example, may vary from size to size.

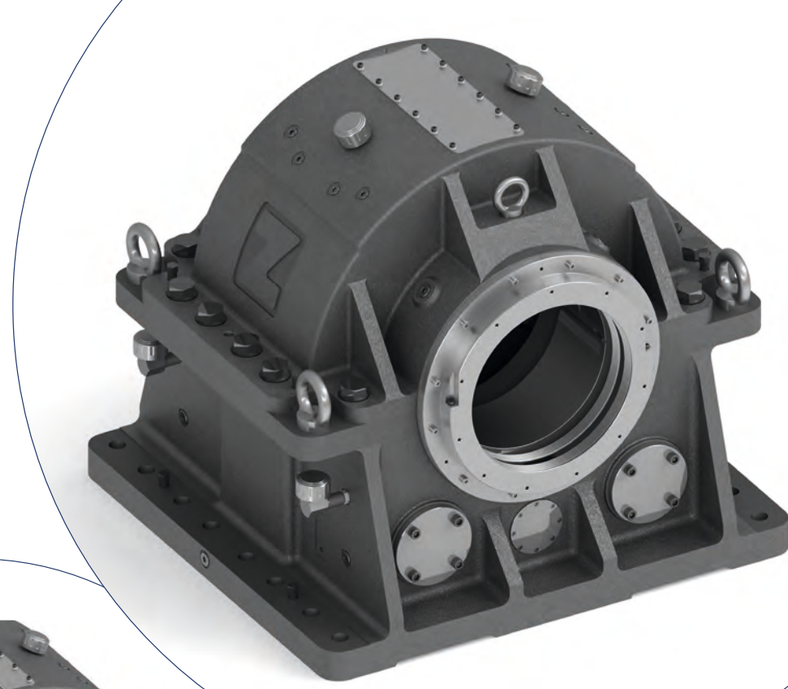
Dimensions of shaft

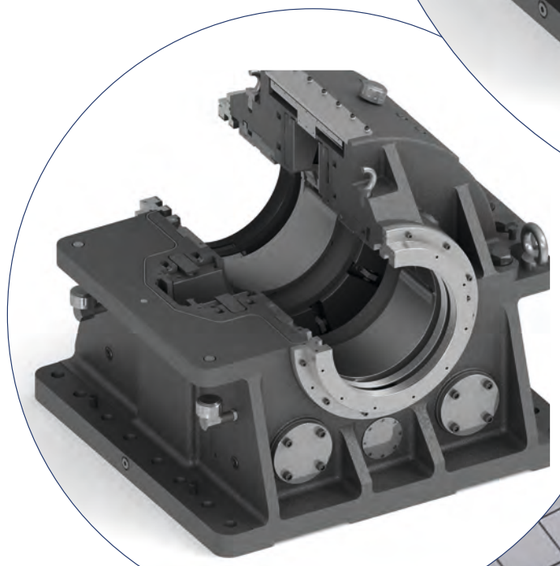
1 // ZT Dimensions of shaft

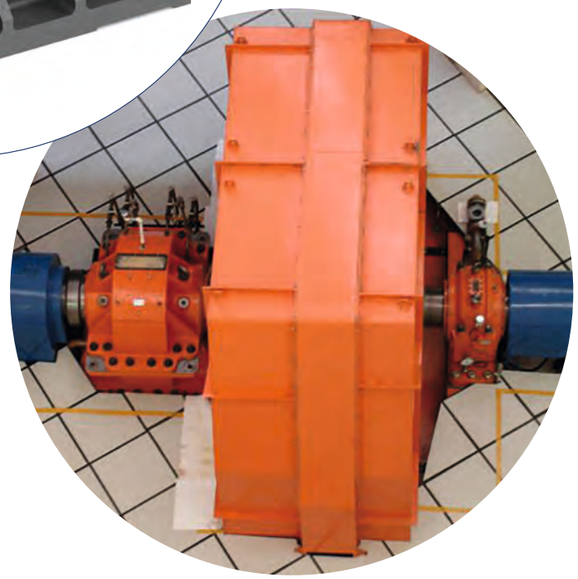
Size	D[1]	b1	b20	b24	d29	d30	d31
40	400	130	320	160	795	420	400
45	450	160	390	160	990	470	450
50	500	225	485	220	1085	530	500
55	550	240	490	220	1200	590	550

Dimensions in millimeters









Bearing types and designations

Z	T				–		–	
1	2	3	4	5		6		7

1 // Type

Z	Plain bearing

2 // Housing

T	Pedestal bearing for high thrust loads

3 // Heat dissipation

Z	Lubrication by oil circulation with external oil cooling

4 // Shape of bore and type of lubrication

L	Plain cylindrical bore with oil disk

5 // Geometry of thrust bearing

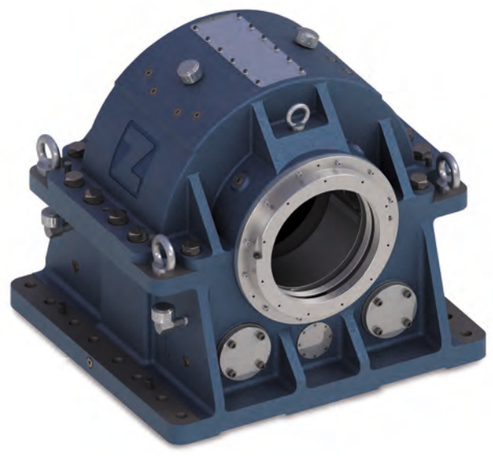
A	Thrust tilting pads

6 // Size

7 // Shaft diameter (mm)

Example of a bearing designation:

Z T Z L A - 50 - 500



Other types of Miba Z Bearings:

ZF - End flange mounted bearing
The type ZF horizontal bearing is designed acc. to DIN 31693 norm specifications for a wide range of heavy duty applications (electrical machines, turbines and test rigs).

ZM - Center flange bearing
The type ZM horizontal bearing is designed acc. to DIN 31694 norm specifications for a wide range of heavy duty applications (electrical machines, turbines and test rigs).

ZR - Pedestal bearing
The Miba type ZR horizontal bearing is designed acc. to DIN 31 690 norm specifications for a wide range of heavy duty applications (electrical machines, turbines, blowers and test rigs).

Checklist

- ☐ Operating conditions for calculation complete?
- ☐ Certification necessary?
- ☐ Hydrostatic required?
- ☐ Oil inlet or outlet flanges required (flange DIN)?
- ☐ Protection class specified?
- ☐ Sealing diameter?
- ☐ Shaft vibration sensors required (thread…)?
- ☐ Speed sensor required (thread…)?
- ☐ Thermal sensors requests?

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