Pole band with stamped pole sections
Model series FTP 55x

Product ID

FTP 55x/Zxxx/Dxxxx.xx/A

- Option (A, B, …)
- Shaft diameter in mm
- Number of teeth
- Model series

General

Function

A pole band strapped to the shaft is a proven approach, where a contactless sensor is to be used to generate signals from a large shaft. It is also a cost- effective alternative to using very large pole wheels.

Sensing is always done via a radially mounted sensor. All mounting and operational tolerances must be allowed for determining the sensing distance, in particular the often considerable radial tolerances of large shafts.

Due to inertial forces every pole band is limited in its maximal rotational speed, strictly speaking in its maximal circumferential speed.

It is necessary that the air gap between sensor and pole sections remains constant during operation. To maintain its tension, the pole band is produced so that its length and the section distance are slightly shorter than the circumference of the shaft.

The number of teeth of the pole band influences:

- Duty cycle of the sensor signal
- Suitable sensor type
- Air gap between sensor and pole band

For air gap calculation, all pole band types with minimal distance from tooth to tooth are similar to module 2 involute gear pole wheels.

Order information

Every pole band is manufactured individually for a customer. The following information has to be provided to Jaquet:

- Shaft diameter (accuracy: +/- 0.1 mm)
- Number of poles
- Maximal rotational speed
- Type of pole band (see below)

Definition of the geometry: pole width in tangential sense is called pole width, pole width in axial sense is called pole length

Variants

Jaquet supplies pole bands in various geometries (FTP 551, FTP 552, FTP 553 and FTP 554, FTP 555, FTP556). These differ in width of pole band and in the geometry of the stamped pole sections. The selection of a pole band type depends on:

- Shaft diameter
- Number of poles
- Pole length
- Speed sensor type

Drawings

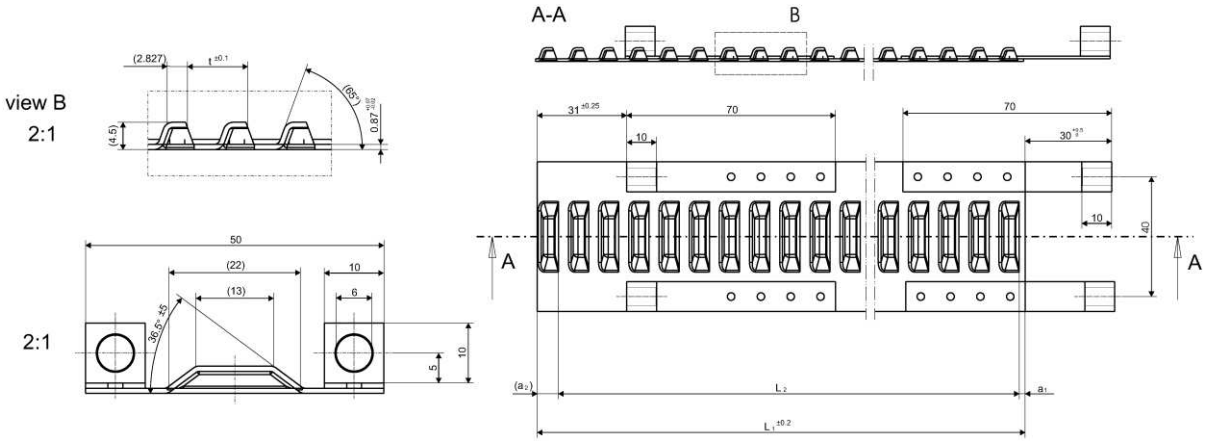
Type	Drawing #	Type	Drawing #
FTP 551	120775	FTP 555	122747
FTP 552	120773	FTP 556	122793
FTP 553	122082	FTP 557	127243
FTP 554	120840	FTP 558	127216-JAQC

Minimal distance tooth to tooth

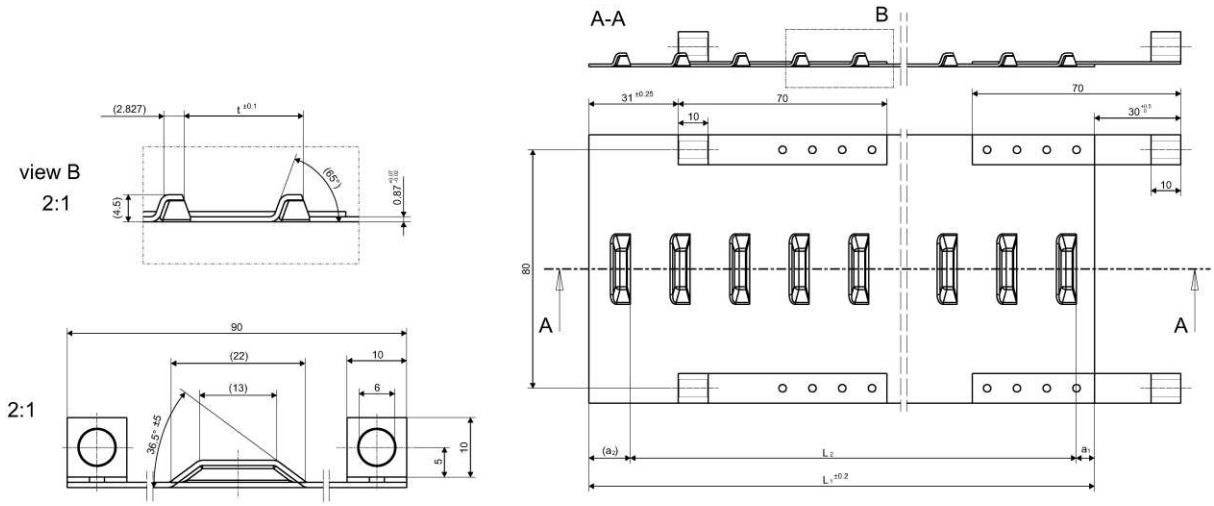
Type	Distance*	Type	Distance*
FTP 551	T_{min} = 10mm	FTP 555	T_{min} = 13.5mm
FTP 552	T_{min} = 10mm	FTP 556	T_{min} = 13.5mm
FTP 553	T_{min} = 6.2mm	FTP 557	T_{min} = 10.5mm
FTP 554	T_{min} = 10.5mm	FTP 558	T_{min} = 10.5mm

* width of tooth + gap between teeth

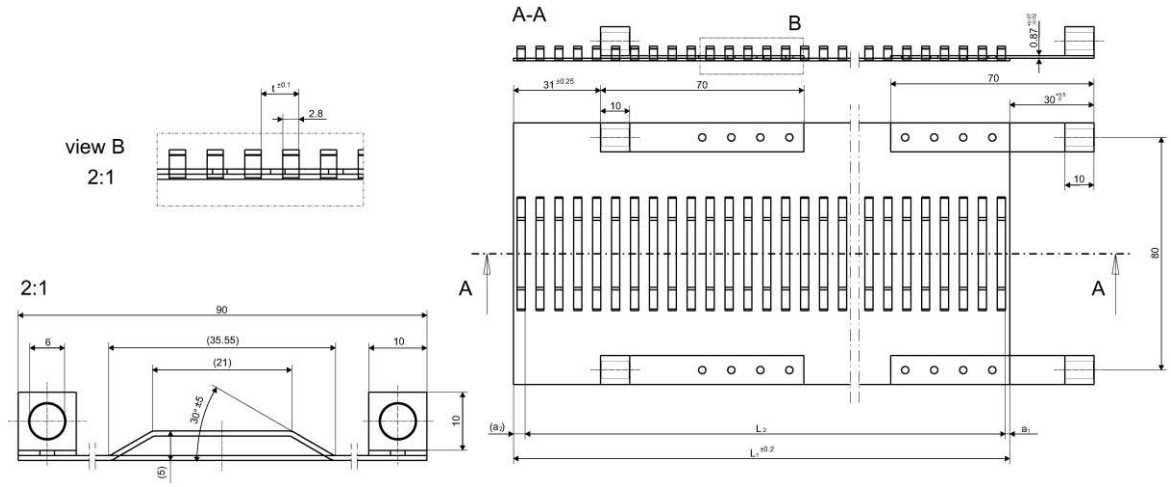
FTP 551 series	Typically used for shafts with small diameters (diameter 200 to 500mm) and sensors which are sensitive to high magnetic gradients.



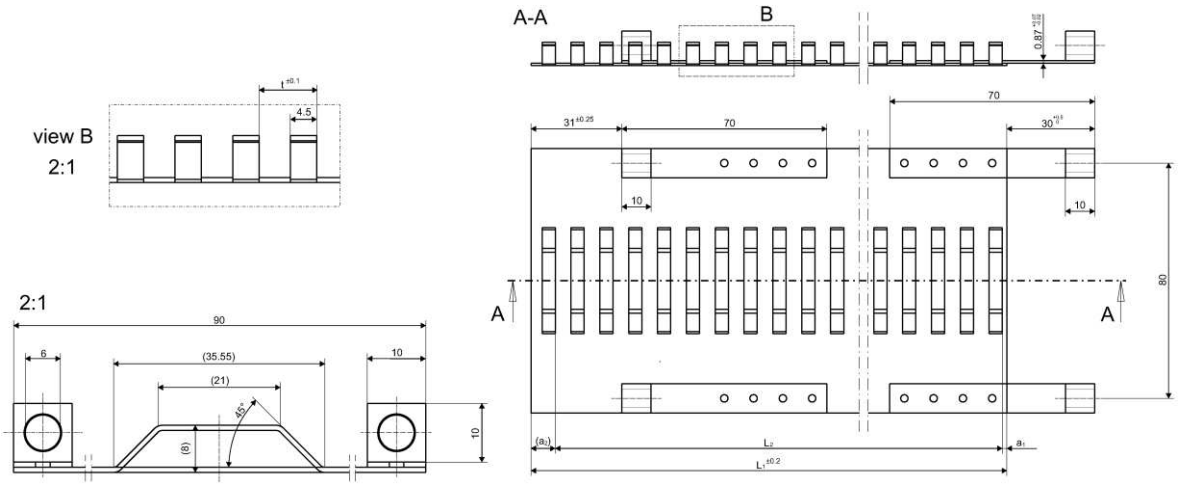
FTP 552 series	Typically used for shafts with large diameters (diameter >500mm) and sensors which are sensitive to high magnetic gradients.



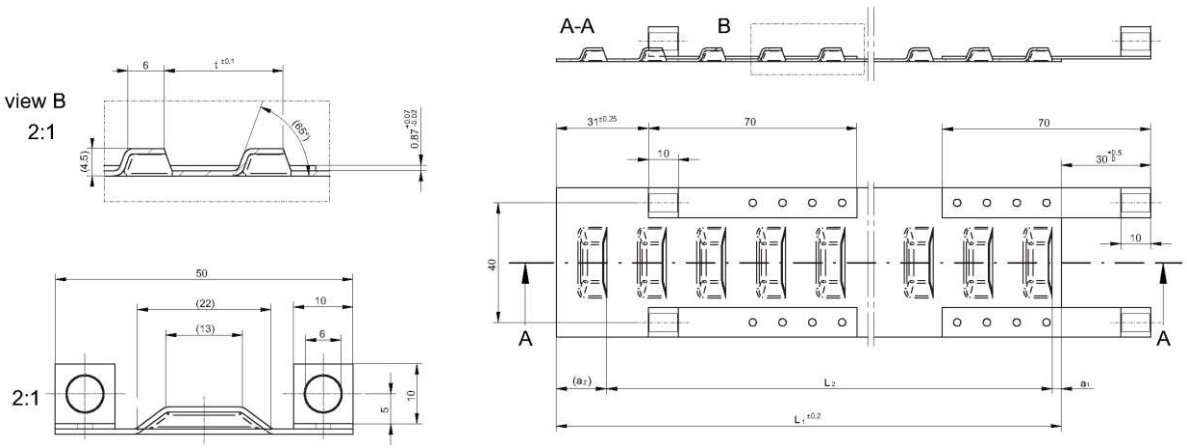
FTP 553 series	Typically used for shafts with large diameters (diameter >500mm), large axial movements of the shaft and large number of poles.



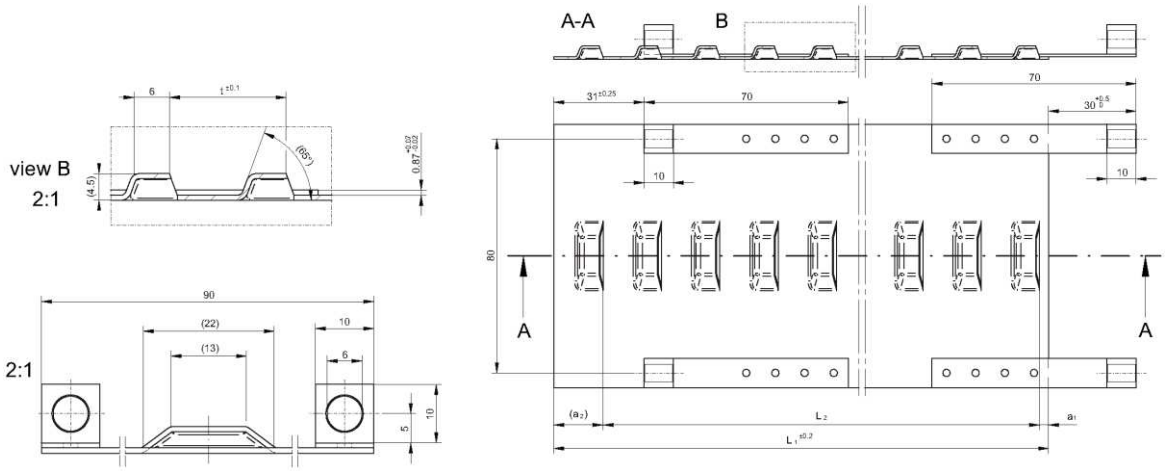
FTP 554 series	Typically used for shafts with large diameters (diameter >500mm), large axial and radial movements of the shaft.



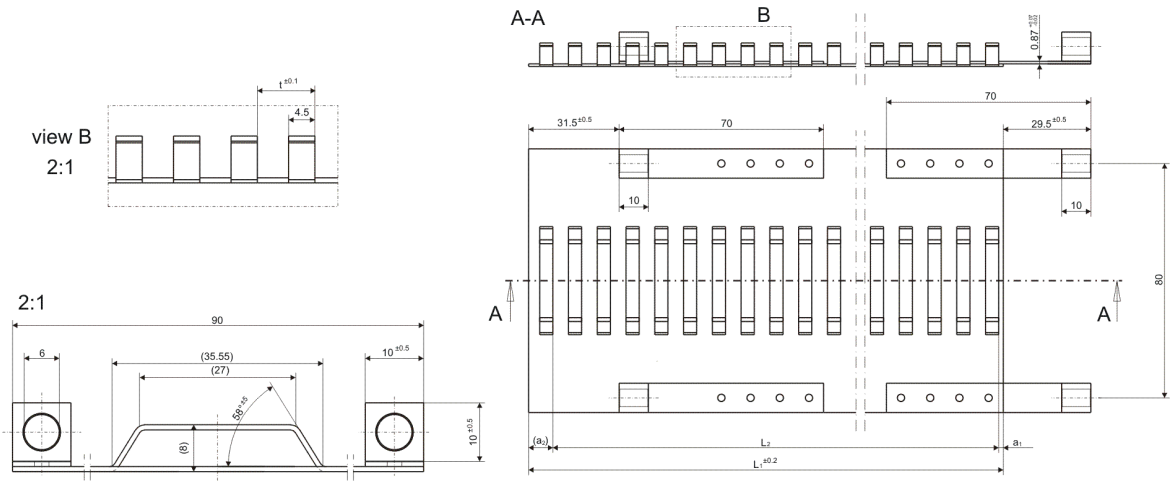
FTP 555 series	Similar to FTP 551, enhanced pole width to provide a better sensor signal duty cycle in conjunction with a reduced amount of poles.



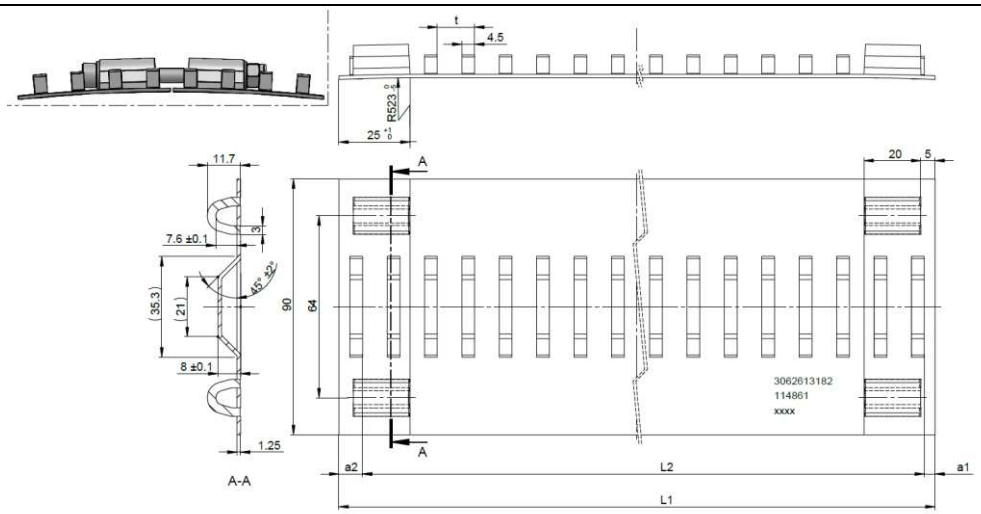
FTP 556 series	Similar to FTP 552, enhanced pole width to provide a better sensor signal duty cycle in conjunction with a reduced amount of poles.



FTP 557 series	Typically used for shafts with large diameters (diameter >500mm), large axial and radial movements of the shaft.



FTP 558 series	Similar to FTP 554, with enhanced locks optimized for mass production versions.



Options

…/A-Option	Pole band deliver in a straight form with the support of flat base. Additional packaging charges are applicable. Requirement for special packaging • pole band for shaft diameter <790mm
…/B-Option	Pole band for higher rotation speed. Feasibility study must be done for each application. Required mechanical parameters for this type of pole band: • Width of pole band = 90mm • Shaft diameter >600mm Pole band has to be mounted according to the fixing torque values in section “fixing torque” (ref. page no. 5)

Mechanical data

Geometry	According to pole band drawing
Material	According to pole band drawing
Surface	Zinc-plated DIN/EN/ISO 9227, passivated blue/white 8-12µm
Maximal rotation speed	Due to inertial forces, the maximum rotation speed has to be limited to prevent destructing the pole band. This value is specified on the drawing.
Storage temperature range	-40°C …+125°C
Operating temperature range	Ferritic steel shaft: -40°C … +125°C, Austenitic steel shaft: -40°C … +40°C, for higher temperatures consult TE Connectivity / Jaquet Technology Group AG

Safety instructions

All mechanical installations must be carried out by an expert. General safety requirements have to be met.

The maximum permissible rotational speed given on the drawing must not be exceeded in any case.

TE Connectivity / Jaquet Technology Group AG cannot be held responsible for damages caused by disregarding these instructions.

Disclaimer

The maximum permissible rotational speed is calculated on material strength parameters using a safety factor of 1.5. This safety factor has been validated experimentally.

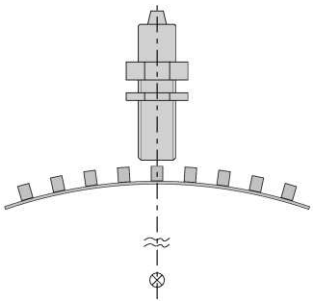
Given the safety factor it may be possible to reliably operate the pole band at a higher speed in a specific application.

However, TE Connectivity / Jaquet Technology Group AG accepts no responsibility for safe operation at speeds higher than those specified.

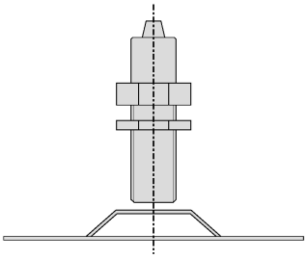
Sensor requirements

Air gap sensor to pole band	Depending on sensor used.
Duty cycle (high/low-time)	Depending on sensor used.
Sensor alignment	The sensor housing has to be aligned to the pole band according the following drawings.

radial alignment (oriented to center):



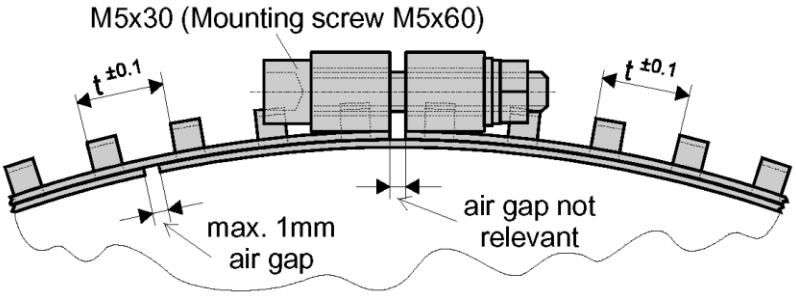
axial alignment (middle of pole):



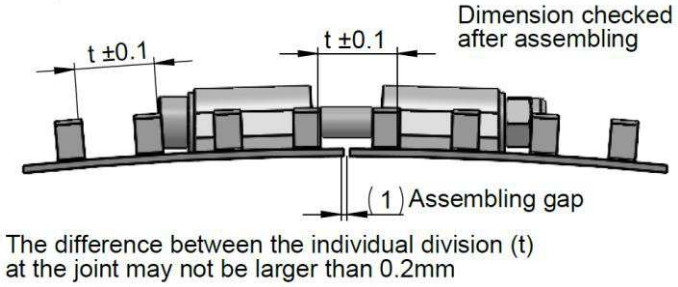
Mounting instruction

General	For optimal sensing the following is recommended: • Radial and axial movement of the shaft must be kept to a minimum (<20% of the pole length). • Sensor to be mounted over the middle of the elevated sections. • The pole band must be fixed securely on the shaft and over the whole circumference. • If the pole band is screwed properly, the gap between the two poles of both ends should be the same as the specified pitch between all poles. • The shaft on which the pole band is mounted must not be magnetized.
Fixing torque	1.75 … 1.85Nm for standard version 2.25 … 2.35Nm for B-option only This fixing torque has to be applied to guarantee a proper fixture of the pole band. Applying a torque higher than specified may damage the pole band or the screws.
Description	The pole band is always 1 mm shorter than the perimeter of the shaft (including the thickness of the pole band). The band must be fitted to the shaft on its whole length. Then it must be tightened with the M5x60 screws with nut and washer. The screws are long enough to connect the two endings of the band when mounting on the shaft. Afterwards, the band must be tightened with the screws M5x30 and the lock washers with the torque given on the drawing. If necessary use a hammer and a wooden block to form the side areas. Do not hit the teeth under any circumstances. When fixing the screws, check the gap (dimension t in the drawing) between the poles of the two endings. If the pole band is correctly stretched the remaining air gap between band endings should be approximately 1 mm. If the ends are touching each other, the band was overstretched and the pitch is not correct which may lead to erroneous measurements. Likewise, at the screw connection the band could bulge. An overstretched band will be permanently too long and must not be used. For screw retention Loctite 270 (or adequate) must be used. If a more secure mounting is necessary, use a suitable screw locking system.

FTP 551 to FTP 557



FTP 558



The difference between the individual division (t) at the joint may not be larger than 0.2mm

Further Information

Maintenance	Product is a maintenance free line replaceable unit. However the solid fit of the band should be verified at regular intervals.
Transport	Product must be handled with care to prevent damages on top of the poles.
Storage	Product must be stored in dry conditions. The storage temperature corresponds to the operating temperature.
Disposal	Product must be disposed of properly. It must not be disposed as domestic waste.

Scope of supply

FTP 551 to FTP 557	1x pole band according to drawing 2x cylinder-head screw M5x60/8.8 (Part no.: 926L-21405) 2x cylinder-head screw M5x30/8.8 (Part no.: 9202608930) 2x washer M5 (Part no.: 9452608931) 2x lock washer M5 (Part no.: 945D-20474) 2x hex nut M5 (Part no.: 940L-20942)
FTP 558	1x pole band according to drawing 2x screw M5x100 2x screw M5x70 2x lock nut M5 4x washer M5

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