

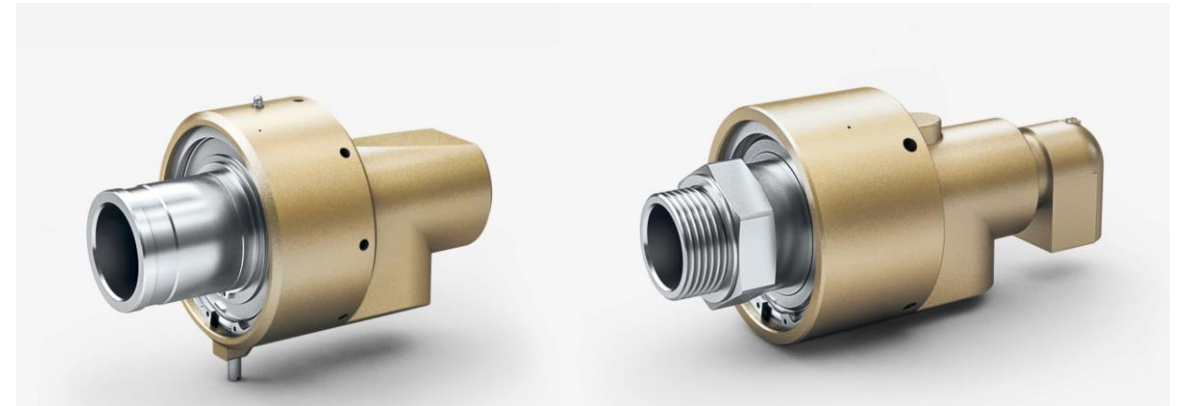


New Rotary Joint Series DS

Introduction Briefing

The DX / DP Challenge

- MAIER produces two series – DX & DP – which **compete** with each other in the range DN 10 to 80.
- Both series are primarily designed for hot and cold **water**. The DP has also been adapted to hot oil but with considerable changes on housing, elbow and O-Rings.
- We face considerable **cost pressure**, especially for cold water applications.
- It is sometimes a **challenge** to offer customers the “best” solution between the two series.
- Making the rotary joint “**smart**” poses considerable design challenges and requires significant compromises with existing designs.



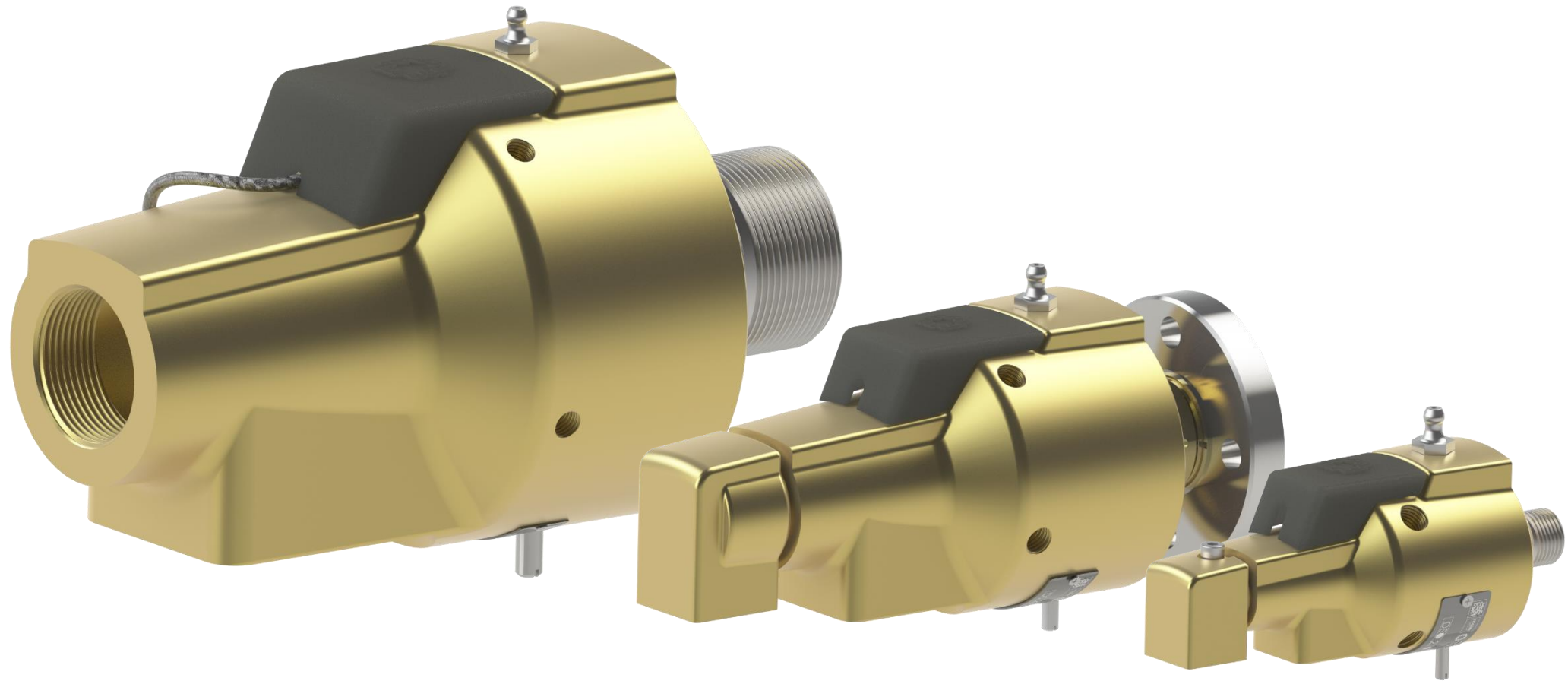
Development Specifications – Successor to DP & DX

Must-haves	Nice-to-haves
<ul style="list-style-type: none"> • Fully backwards compatible with DP & DX • Modular Design → easy to configure • Support for various inner tube systems • Suitable for water, hot water, thermal oil and air • “Best” Performance (temperature, pressure, rotational speed) • Sensor-ready design • Rotor with conical BSPT (PT/Rc) thread as additional standard 	<ul style="list-style-type: none"> • Balanced mechanical seal • Spring outside medium flow • Consistent “look” from DN 10 to 80 • B2-Principle (for rotating inner pipe) available

Development Guidelines

- Fully backward compatible => new types must be able to be installed in their applications without any effort for the customer (all connection dimensions including inner pipe)!
- Modular design => modular system with efficient parts management
- "Best performance" => the successor types must at least achieve the performance data of the predecessor types.
- Easy integration of wear sensor (not possible with DP, very difficult with DX)
- Balanced mechanical seal (as with DP) => reduced seal friction, better speed suitability, lower seal wear.
- Spring not in media flow (disadvantage with DP) => turbulence due to media flow causes flow losses and can lead to vibration fractures of the spring

DS – NEXT GENERATION



NEXT Generation - DS

Must-haves

Backwards compatibility to DX & DP:

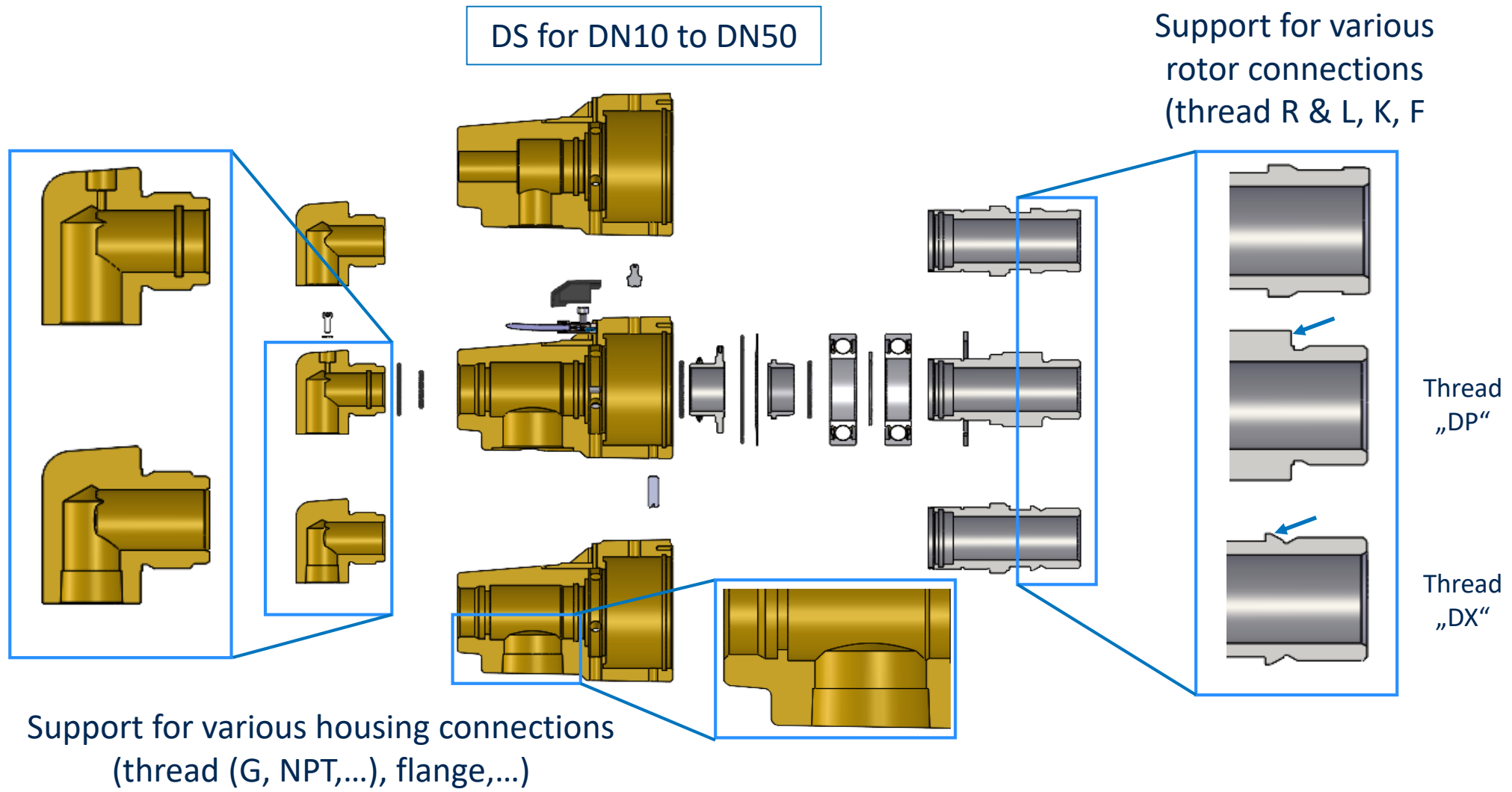
- Design and sizes of the rotor connection (R, L, K, F, ...) to the roll
- Design (e.g. thread standard, flange type) and sizes of the housing connections
- Overall length of the rotary joint is almost identical as the predecessor series
- Positioning, length and diameter of inner pipes (both stationary and rotating)
Exception: When replacing a DP -8xx type (hot oil) the inner pipe length must be adjusted
- Small geometry differences exist for: Grease nipple (position compared to DP), locking pin (length), rotor centering length on K-rotor DN 65 & 80 (taken over from DP for DS => provide longer screws for flange)
- A DP elbow does NOT fit on a DS housing (G/BSP-thread instead of NPT)!!!

NEXT Generation - DS

Must-haves

Modular Design

Support for various inner tubes and elbows (stationary, rotating, PO2)



Modular Design

- DN 10 to 50:
 - Brass housing like DP/DX
 - Housing is one-piece
- DN 65 & 80
 - Housing made of "Ni-Resist" (corresponds to a gray cast iron (SG iron) with high nickel content => very high resistance to corrosion)
 - Housing is in two parts! Bearing housing (always same geometry) plus connection housing (specific design depending on connection and inner tube guide)
 - Seal can be replaced without removing the rotary joint from the roll
- All designs
 - Sealing combination 1, 3, 4 & 5 - as for DP
 - Rotor made of stainless steel
 - Standard FFKM O-rings suitable for standard applications (hot water & thermal oil), special materials for higher application limits possible

NEXT Generation - DS

Must-haves

Media suitability:

- For water and thermal oil as standard, for air with optimized sealing combination

"Best" Performance

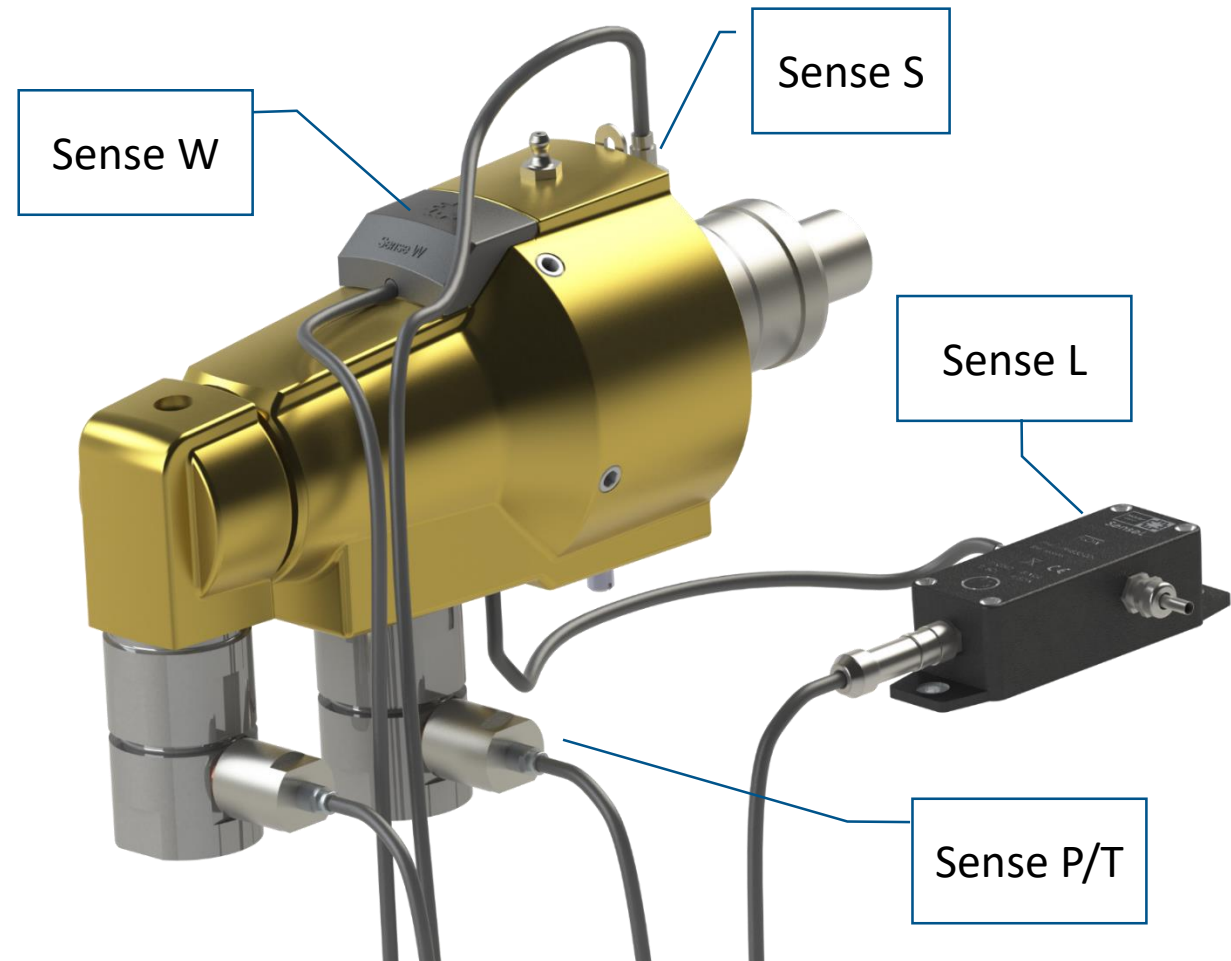
- Pressure: max. 10 bar
- Temperature: 140 °C for water, 160°C for thermal oil
- Speed: 55,000/DN (same as DP series)

NEXT Generation - DS

Must-haves

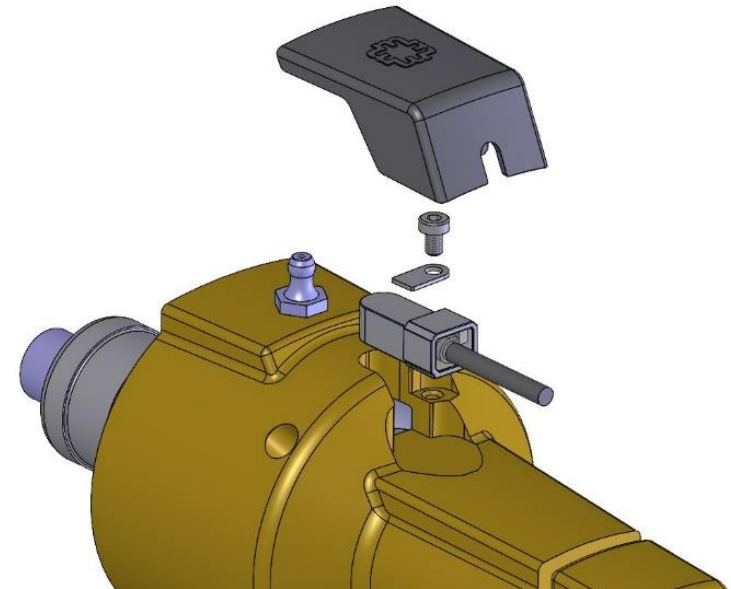
Sensor-ready design:

- Wear sensor Sense W (integrated!)
- Speed sensor Sense S
- Leakage sensor Sense L
- Pressure & temperature sensor Sense P/T
- (Torque sensor Sense M – not shown)



Integrated Wear Sensor SENSE W

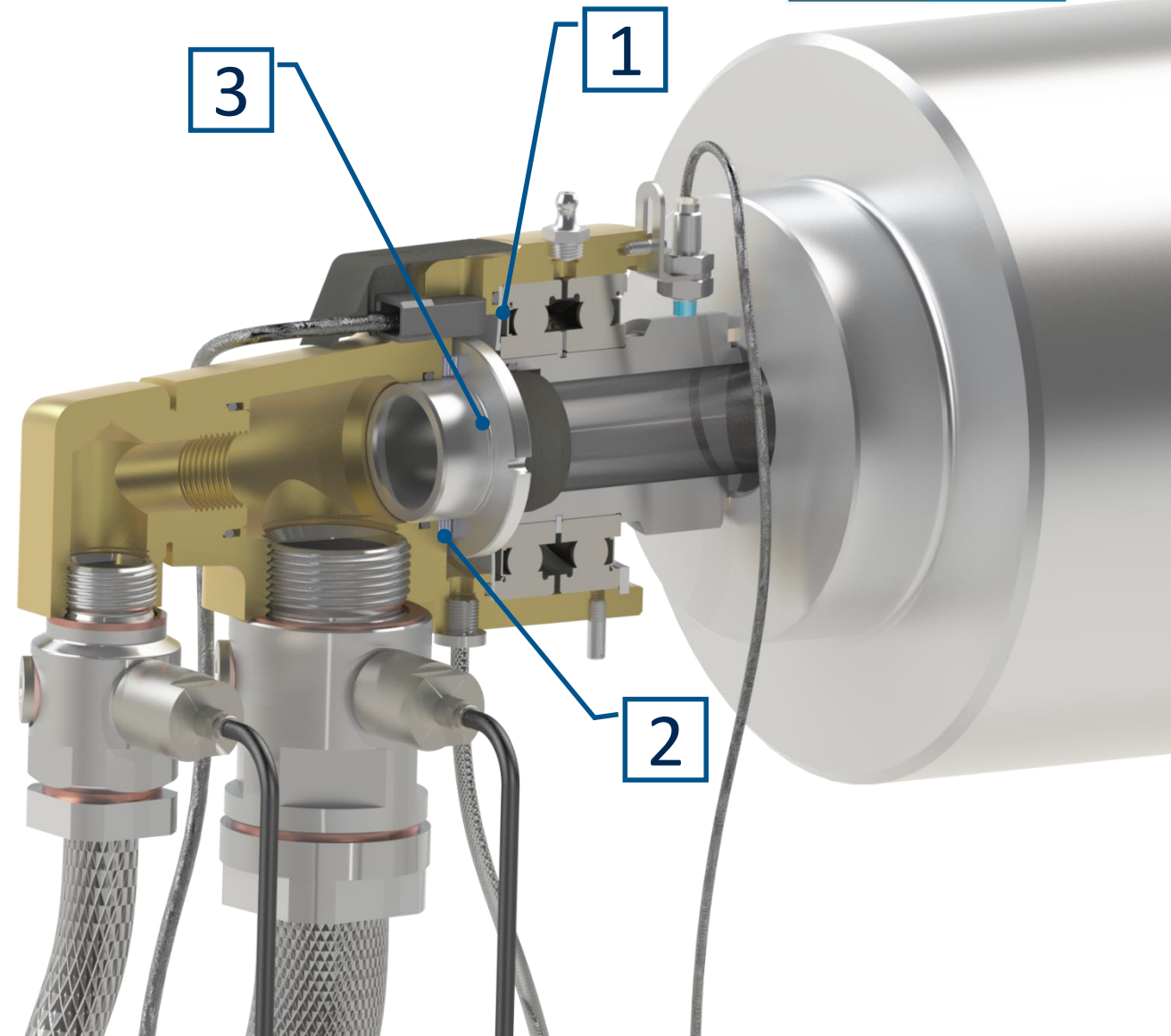
- All DS housings are designed to be equipped or retrofitted with wear sensor.
- Wear sensor consists of mechanical seal + sensor with cable
- Black plastic cap for sensor protection
- *The sensor can also be retrofitted later. For this, the sensor and a mechanical seal with magnet must be installed during a repair (will be supplied as a pair)*



NEXT Generation - DS

Other technical improvements

- Bearing protection seal (1) for increased reliability
- Spring (2) outside the medium flow for better hydraulic efficiency
- Balanced mechanical seal (3) for low frictional torque
- Split housing for sizes DN 65 – 80 (not shown) allows the replacement of the mechanical seal without removing the joint from the roll



Sales Topics

- Exchange of DP/DX with DS
 - Change-over tool available in the configurator, DP joint plus elbow (2 article numbers) equate to DS 2xx (will be continually expanded by special types)
 - A dimension sheet (customer drawing) and a STEP file are available for all (interchanged) DS types. There will be **overview drawings** in catalog format!
 - DPN, DP 06, all DXSA- (e.g. all rotary joints for stretch blow molding machines) and DP/DX/DXS greater than or equal to DN 100 will remain
 - Some other special DP/DX types may remain
- Pricing
 - As-a-rule: price of the predecessor type (DP/DX/DXS) results in the new DS price
 - The DP -800 versions are replaced by the new DS standard version => standard price but inner pipe adaptation necessary!
 - The DS successors of the **mono variants** of DX/DXS versions with K or F flange get the equivalent DP price (typically lower)

Sales Topics

- Timeline of Market Introduction
 - **STANDARD** DS variants can be ordered from the end of 2023. First deliveries for DN 10 to 50 from the beginning of 2024
 - Successors of **SPECIAL** types (DP/DX/DXS with –xxx suffix) are evaluated individually and possibly converted
 - DS types in DN 65 & 80 will be available in Q2 2024 (orders possible from Q1 /2024)
 - Operating instructions and wear part kits for DS series for repair will be available from Q1/2024.

- Availability of discontinued DP/DX/DXS-Types
 - DS as successors for modified / adapted types of the DX/DXS or DP series (recognisable by the variant number "-xxx" at the end of the designation) are analyzed individually.
 - Detailed technical information (e.g., conversion tables, catalogues, dimension sheets, STEP files, etc.) will be available on our website or directly from your maierGROUP contact as of September 2023.

Summary

- Why DS
 - Our developments in sensor technology (wear) make massive modifications necessary => development of new series is easier.
 - Improved design (combination of advantages / elimination of disadvantages) / improved performance.
 - Additional "value" but cost neutral for the customer.
- Communication
 - Basically: Focus on the advantages - eliminate any disadvantages / changeover pain (passively) (where possible!).
 - Basically: It is our ambition to make the replacement as smooth as possible for the customer.
- Tools
 - Configurator / Excel file for recoding (configurator works better for DP + elbows).
 - STEP files and general drawings.
 - Catalogs (DE & EN) and info on website.