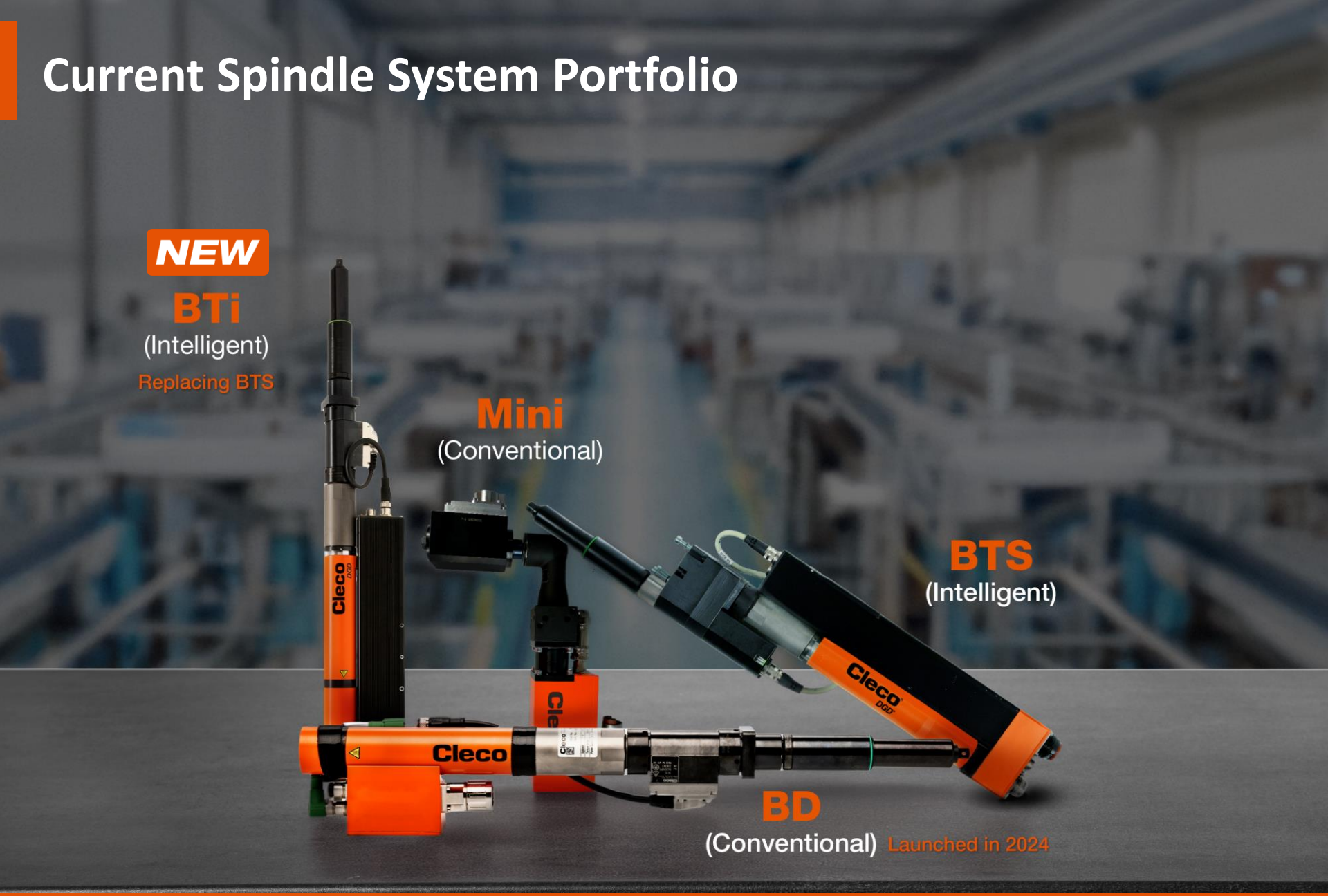
BTi Intelligent Spindle System



Cleco | Tame the Line

Current Spindle System Portfolio



BTi Spindle System Features & Benefits

Simplicity
Patented daisy-chain cables, spindles with on-board servo, and system modularity enables simple set up without compromising productivity.

Smaller System Footprint
On-board servo, daisy-chain cable, and modular compact controller combine to deliver reduced footprint.



Rapid Fault Recovery & System Restart
Advanced intelliArmed™ Error Management System facilitates rapid fault recovery diagnostics. Upon unexpected interruptions, system can restart within ~40 seconds.

Lower Total Cost of Ownership
Costs are reduced due to simple set up, single cable design, system modulatiry, and ability for rapid line rebalancing and ease of future upgrades.

New BTi vs BTS



Why BTi?

- Expanded spindle capability
- Improved troubleshooting (intelliArmed™ - Error Management system)
  - ✓ User friendly interfaces
  - ✓ Increase productivity
  - ✓ Time efficiency (MTTR)
  - ✓ Enhanced decision making
  - ✓ Diagnostics
- Proven system reliability
- Mounting compatibility with legacy

WIPO

Patent #WO 2022/164973 A1

Smart, Flexible & Simple Assembly Solutions

BTi System Architecture

Power Distribution Module

Voltage Adjusting Module)

Up to 16 Spindles

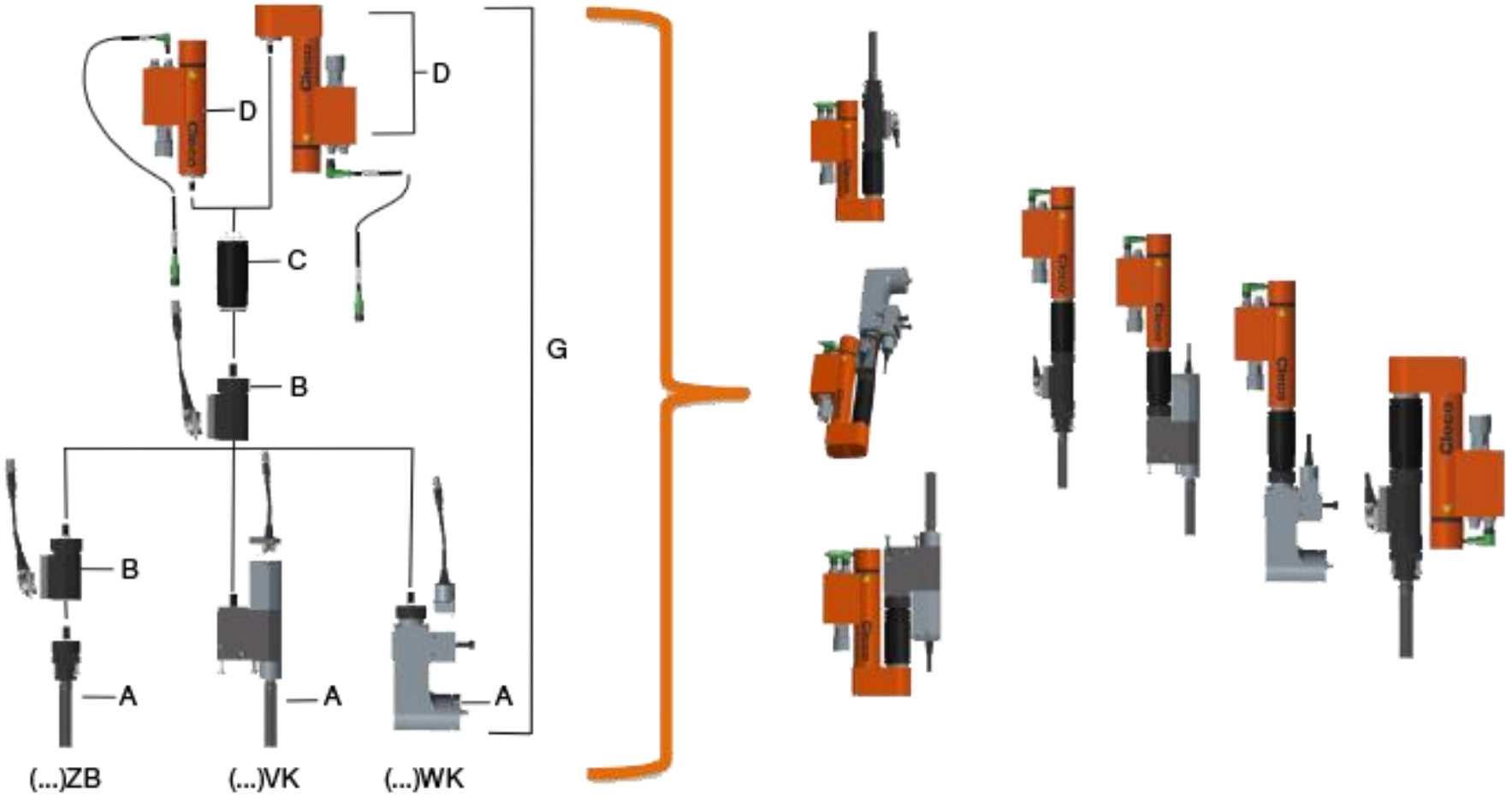
PDMi

VAMi



- Patented Daisy Chain Connection
- IP 54 rating
- STO feature
- Fast and clear error diagnosis possible through Ethernet based communication

BTi Spindle Modular Design

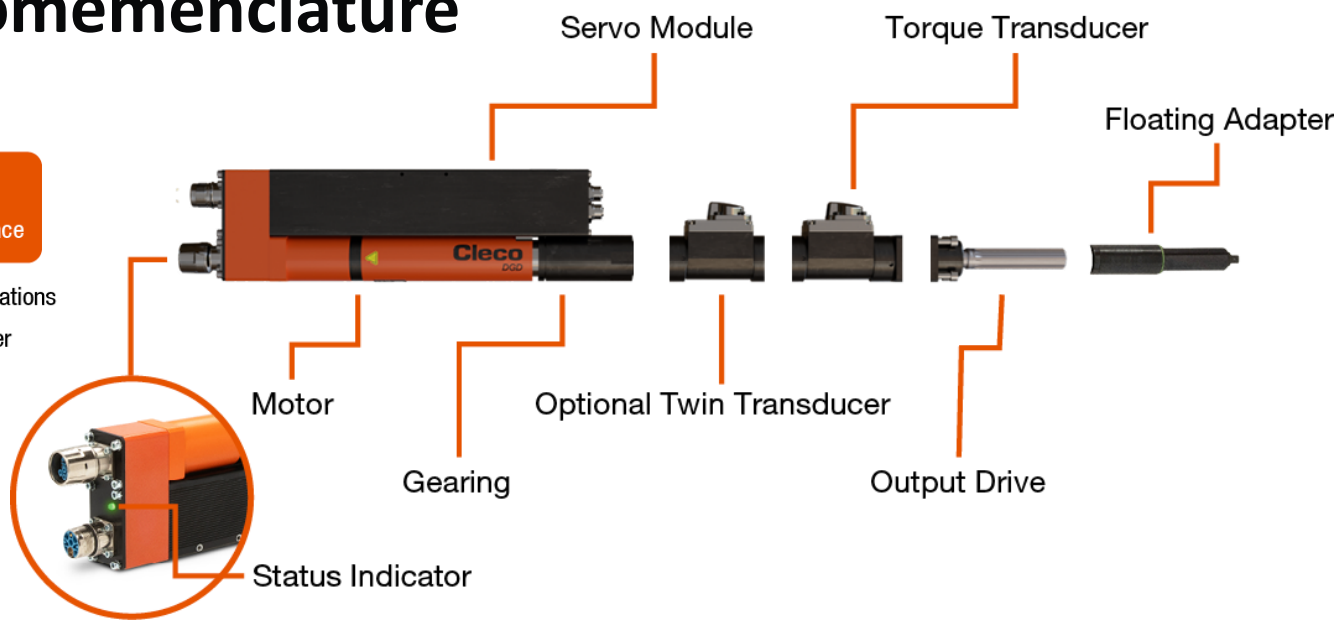


BTi Spindle Nomemenclature

PATENTED

- Industry-first daisy chain system
- Industry-first compact on-board intelligence

- Wide variety of spindle sizes and configurations
- Twin digital torque transducer and encoder



Example **1 BID 53 T1 S A**

X XXXX XXXX X X X

Size
1 - 2-53 Nm
2 - 11-200 Nm
3 - 30-300 Nm
4 - 50-2800 Nm

Motor with servoamplifier & measurement card
B - Brushless Motor
I - intelliArmed
D - Digital
U - Reversible gear

Maximum Torque (Nm)
12, 53, 110, 2800...

Transducer
T1 - Single
T2 - Twin

Output Drive
S - Straight
O - Offset
A - Angle

Revision
A, B, C...

Note: Floating spindle adapter must be ordered separately.

BTi Torque-Range and Speed

Size	Torque Range		Speed
	Min (Nm)	Max (Nm)	rpm
1	2	12	3317
1	3.5	35	1255
1	5.3	53	737
2	11	110	890
2	20	200	501
3	30	300	480
4	50	500	269
4	66	660	183
4	320	1250	91
4	400	1600	72
4	980	2800	38

Power Control Package with intelliArmed™

Controller **PDMi** (Power Distribution Module)

- TSNet system Bus
- 7” color display with touch function
- Rapid start-up <40 ms after reset of emergency stop
- IP 42
- TÜV certified STO (Safe torque off)
- AnyBus® fieldbus modules available
- PROFIsafe
- Energy Save



VAMi (Voltage Adjusting Module)

- Module converts the mains voltage (3-phase) to a supply voltage (3-phase) of 3× 270 VAC for the PDMi.
- Energy save function (stand by mode). Power loss is reduced by approximately 10 watts per fixtured spindle in standby mode.
- Main switch, circuit breaker and status light on front.
- IP54
- CE



Maximum number of fixtured spindles per system

The number can vary depending on the demands of the application.

System	Maximum number of fixtured spindles				Max. number of strands
	1BID(U)-(...)	2BID(U)-(...)	3BID(U)-(...)	4BID(U)-(...)	
1x VAMi(E) + 1x PDMi(...)	16	6	6	6	1
1x VAMi(E)-3S + 3x PDMi(...)	32	6	6	6	3

New BTi vs BTS

Improved Safety Efficiency, Integration and Lower Energy Consumption Specifics

	BTi	BTS
		
STO Reset Time	~0.2 sec	~ 2 sec
Safety Architecture	PL d Cat.3 Distributed (PDMi...n Spindles) integrated circuitry (less wires, less space, less component cost)	PL d Cat.3 Centralized discrete (wired) safety components
Integration in Higher Level System	Discrete 24 V STOA/STOB signals or via PROFIsafe Protocol	Discrete 24 V STOA/STOB signals
Energy Consumption	~ 2 W	~ 12 W

Cleco Fixtured Spindle Solutions

Intelligent Spindle Gen II (Series: BTi)

Value enhancements to our existing system:

PATENTED

- Improved troubleshooting (EMS System)
- Quicker response time to cycle interruptions
- Mounting compatibility with legacy
- Increased date transfer speed
- Global standard product
- Expanded torque range
- Increased free speed
- Ease of integration
- Energy efficient



Conventional Spindle (Series: BD)

Value:

- Speed
- System simplicity
- Common gear sets
- Adapters
- Proven productivity



Intelligent Spindle (Series: BTS)

Value :

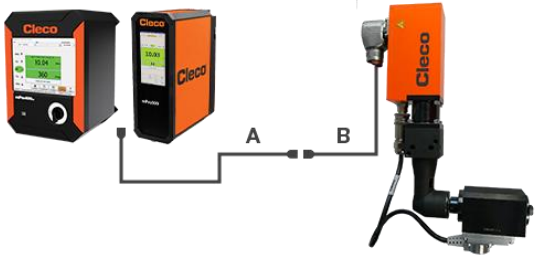
- Optimized cable management
- Single “Daisy chain” cable design
- Lower total cost of ownership
- Proven productivity



Conventional Mini Spindle (Series: Mini 5-35 nm torque)

Value:

- Light weight
- Fast
- Compact for tight areas
- Proven productivity



Highly Productive Engineered Assembly Solutions

Thank you!



Cleco | Tame the Line