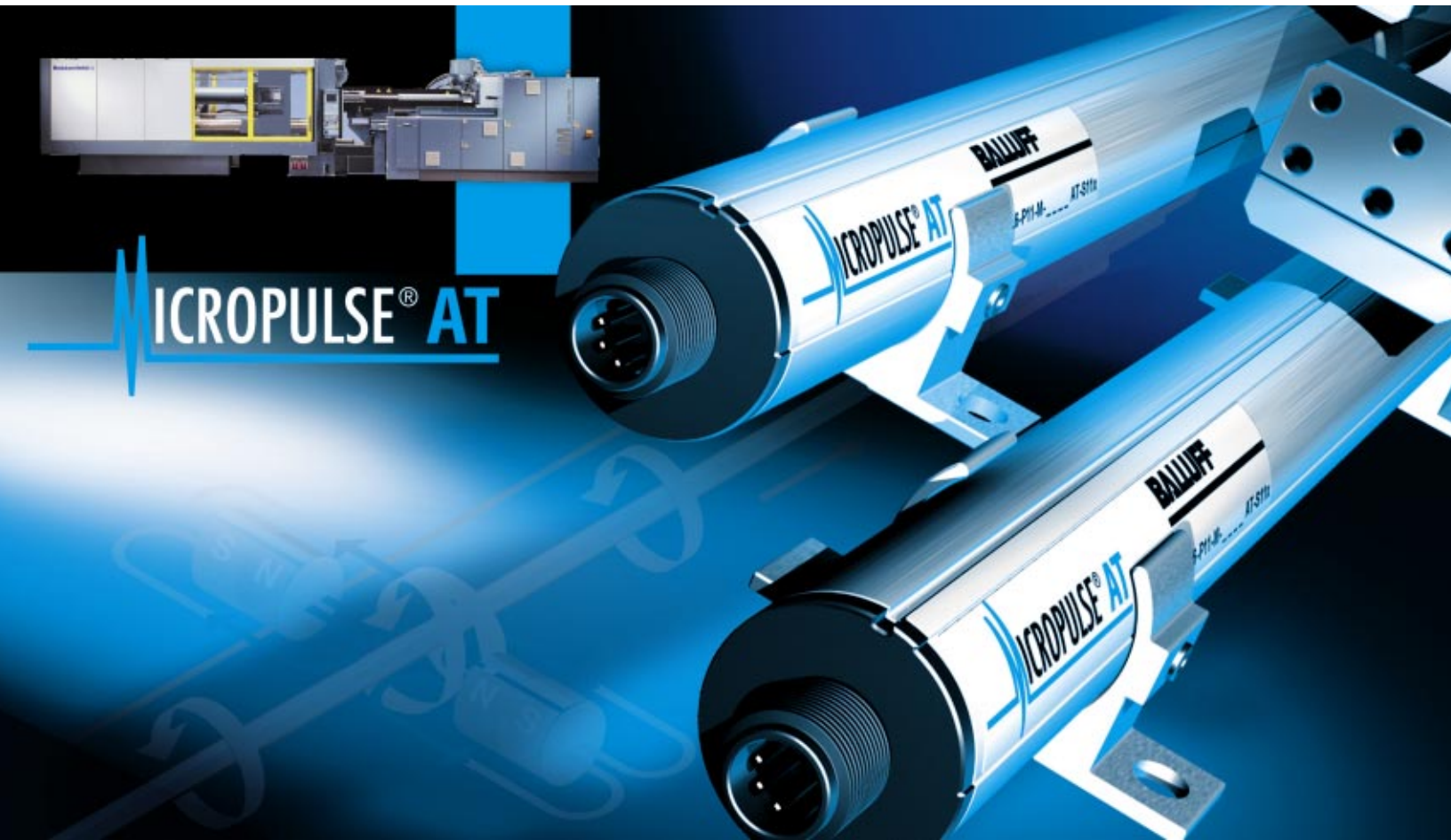
BALLUFF

Micropulse AT

the new advanced tubular position feedback system



Micropulse AT
An all-around performer

Introducing the new non-contact linear positioning transducer from Balluff. The use of non-contact position sensors is now an affordable alternative to wear-limited potentiometers.

Product Range
- 0-10 V analog
- Start/stop pulse interface
- 2-60” start stop
- 4-60” analog

Focus Features
- Rising and falling (P&M) interface merge together
- Mechanically compatible to standard Micropulse
- Dual analog output versions for double magnet applications
- IP67
- Floating magnet only
- Connector versions only – no cable
- Resolution – 10 microns
- Linearity – 0.02%

An all-around performer!

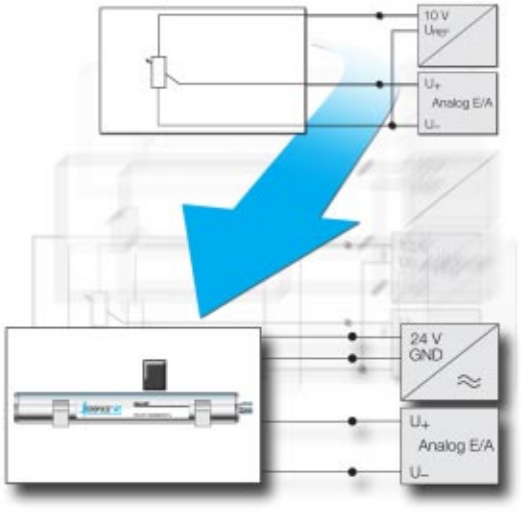
The new Micropulse AT magnetostrictive transducer has been specifically designed to meet the demands of cost-conscious machine builders. Free from the old mechanical technology, yet compatible with standard products, the round Micropulse AT design sets new standards when it comes to the price/ performance ratio!

Target Markets
- Printing
- Plastic
- Automotive

Applications
- Plastic injection molding machines
- Printing presses

Flexible and cost-effective mounting options and state-of-the-art technology, combined with a non-contact operating principle make this sensor unique in the industry. Both the traditional 0-10 V analog output version, as well as the now widely-accepted, highly noise-immune, start/ stop pulse interface is now available.

Make the switch to Micropulse®!



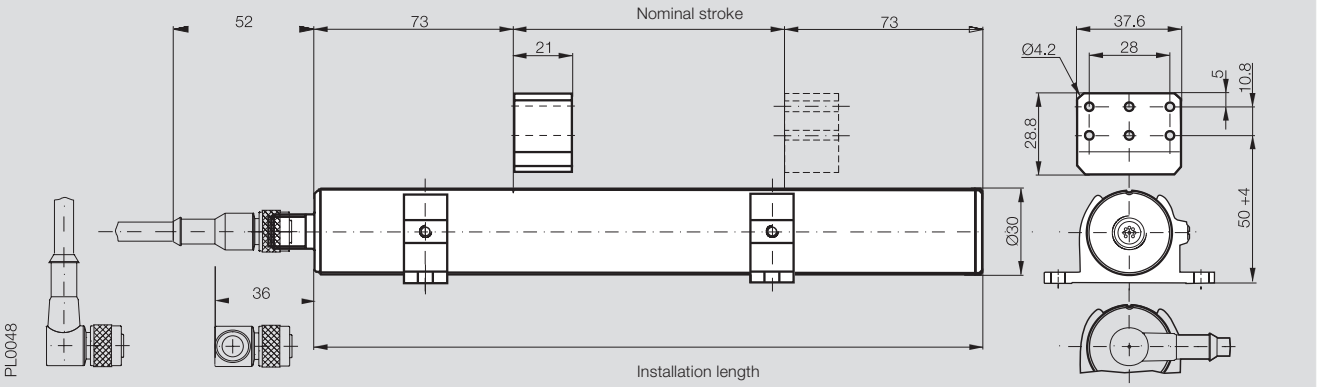
Potentiometer connections, block diagram

Micropulse transducer connections, block diagram

Magnetostrictive technology at a potentiometer price!

Series	Micropulse AT
Output signals	Analog Voltage & Digital Start/Stop Pulse

Transducer with floating magnet, S115 connection with BKS-S115/BKS-S116 connector for transducers with analog interface and digital pulse interface



Ordering Code	BTL-6-___-M___-A1-S115 (see below)
Measurement type	Linear displacement
Measurement range	51 mm (2") to 1524 mm (60")
Shock rating	50g/6 ms per IEC 60068 2-27
Vibration rating	12g, 10 to 2000 Hz per IEC 60068-2-6
Environmental protection	IP67 (with connector attached)
Housing material	Anodized aluminum
Operating temperature	+32 to +160 degrees F
Storage temperature	-40 to +212°F
Humidity	<90% non-condensing
Connection type	8-pin micro connector
Compatable magnets	See accessories

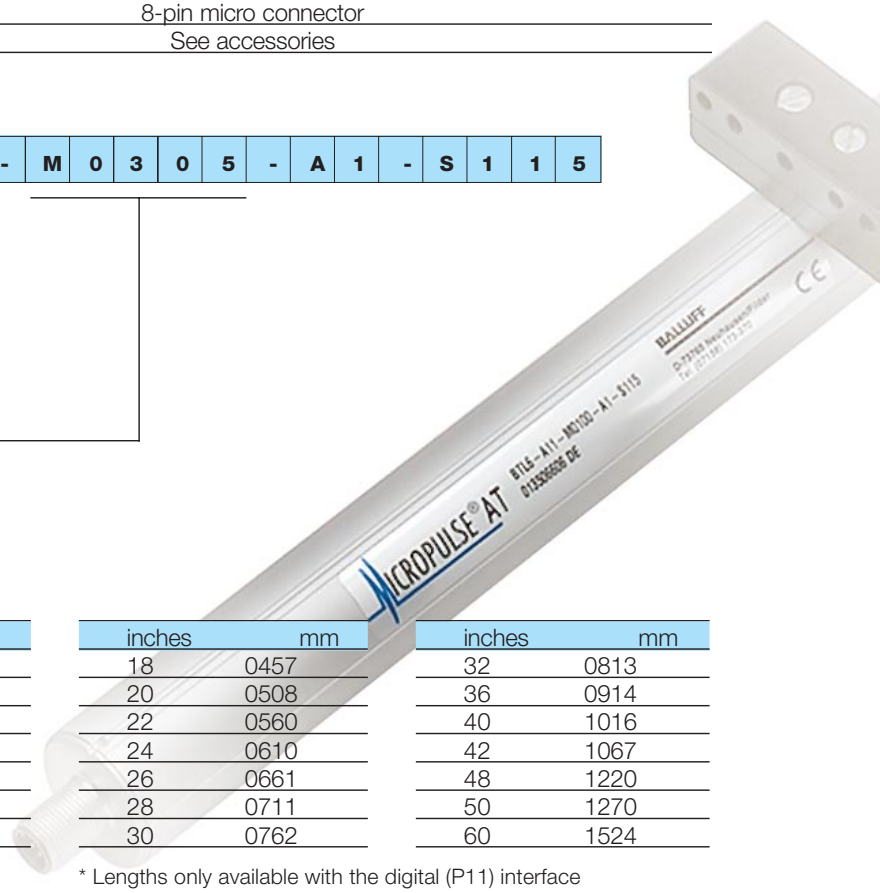
B	T	L	-	6	-	A	1	1	0	-	M	0	3	0	5	-	A	1	-	S	1	1	5

Output Type/Supply Voltage
A110 = +24 Vdc Input
0 to 10 Vdc / 10 to 0 V dc output
P110 = +24 Vdc Input
RS422 Start/Stop pulse output

Normal Stroke Length

0	3	0	5

= 305 mm active stroke



Standard Stroke Lengths

inches	mm	inches	mm	inches	mm	inches	mm
2*	0051	9	0230	18	0457	32	0813
3*	0077	10	0254	20	0508	36	0914
4	0102	11	0280	22	0560	40	1016
5	0127	12	0305	24	0610	42	1067
6	0152	13	0330	26	0661	48	1220
7	0178	15	0381	28	0711	50	1270
8	0203	16	0407	30	0762	60	1524

* Lengths only available with the digital (P11) interface

Electrical Interface	Analog	Digital
Electrical Type	Voltage	Start/Stop & PWM
Part No. Code	BTL-6-A11-M____-A1-S115	BTL-6-P11-M_____-A1-S115
Output	0…10 V and 10…0 V	Digital START/STOP pulse
Output Load	5 mA max.	per spec
System Resolution	≤10 mm	Controller dependent
Non-linearity	+/- 200 µm to 20" nominal stroke, typ +/- 0.02%, max. +/- 0.04% 20" to 60" nominal stroke	+/- 200 µm to 20" nominal stroke, typ +/- 0.02%, max. +/- 0.04% 20" to 60" nominal stroke
Repeatablity (resolution + hysteresis)	≤10 µm	≤10 µm
Repeat accuracy	≤20 µm	≤20 µm
Temperature Coefficient *	[150 µV/° C + (5ppm/°C*P*V/NL)] * ΔT	[0.6 µA/°C + (10 ppm/°C*P*V/NL)] * ΔT
Operating voltage	24 Vdc ±20%	24 Vdc ±20 %
Operating current	≤70 mA	≤60 mA (at 1K Hz sampling rate)
EMC Compatibility:		
RF Emission	EN 55011 Group 1, Class A	EN 55011 Group 1, Class A
Static electricity	IEC 61000-4-2 Severity Level 3	IEC 61000-4-2 Severity Level 3
Electromagnetic fields (RFI)	IEC 61000-4-3 Severity Level 3	IEC 61000-4-3 Severity Level 3
Fast transients (BURST)	IEC 61000-4-4 Severity Level 4	IEC 61000-4-4 Severity Level 4
Line-carried noise induced by high-frequency fields	IEC 61000-4-6 Severity Level 3	IEC 61000-4-6 Severity Level 3

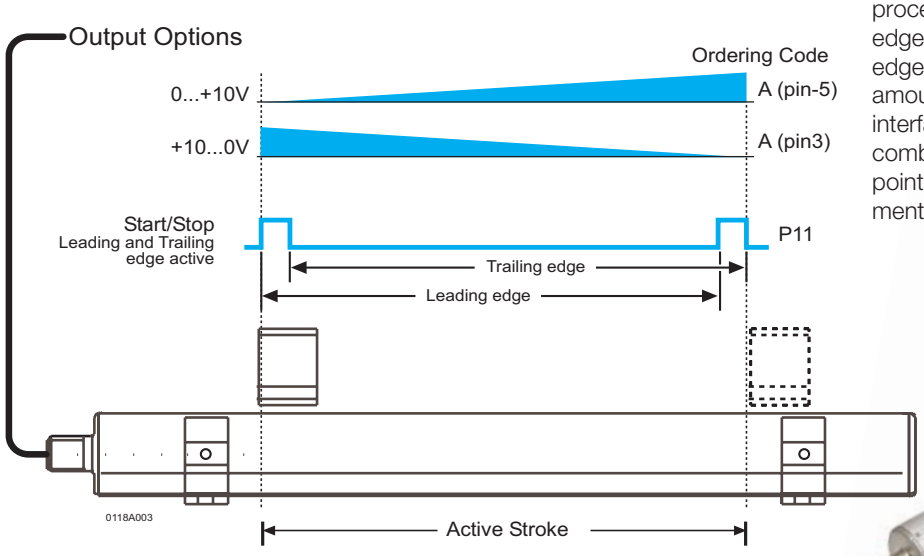
Notes:

* Temperature coefficient variables:
  - **V** = output range in [V]
  - **ΔT** = temperature change
  - **P** = magnet position

Micropulse AT provides your choice in output options!

☑ **Traditional 0-10 V analog output**

☑ **Widely-accepted, highly noise-immune, start/stop pulse interface**

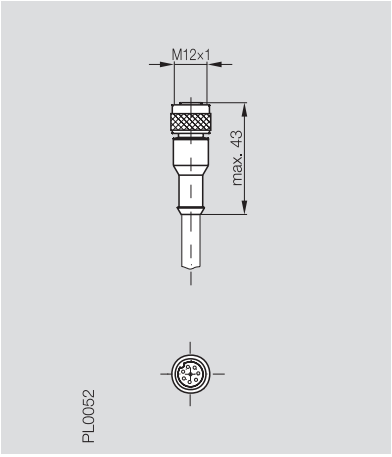
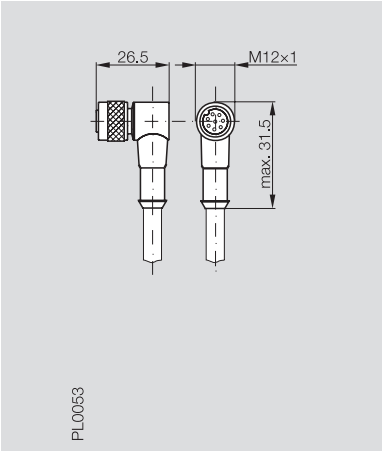


P11 Interface

Compatible with Balluff BTA processors and various OEM controls, e.g., Allen-Bradley, Siemens, Mitsubishi, Parker, Bosch, Esitron, etc. The P11 START/STOP interface offers reliable signal transmission over cable lengths up to 1,600 feet. RS422-compatible differential line drivers/receivers are used to ensure that noise signals are effectively suppressed.

P11 Replaces P1 & M1

Based on differing philosophies, two controller-specific interfaces have been established for the digital pulse versions. The difference lies in how the edges are processed. In the "P" interface the falling edges and in the "M" interface the rising edges are processed. To reduce the amount of part numbers, the "P11 interface" has been developed which combines both functions. The reference point for the propagation time measurement is the "Start" pulse.

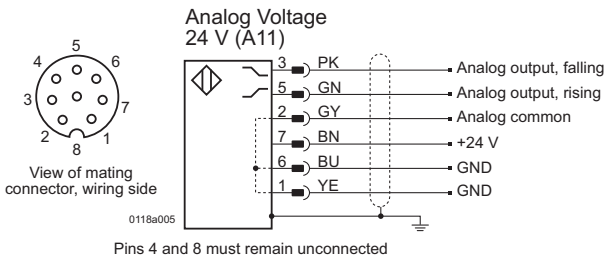
Product Type	Connector, Straight Micropulse AT Connector	Connector, Right angle Micropulse AT Connector
		

Ordering Code	BKS S115-PU-_ _	BKS S116-PU-_ _
Housing material	PUR	PUR
Contacts	CuZn	CuZn
Contact finish	0.8 µm Au	0.8 µm Au
Enclosure rating per IEC 60529	IP 67	IP 67
Knurled coupling ring	CuZn	CuZn
Finish	2.5 µm Ni	2.5 µm Ni
O-ring	Viton	Viton
Cable	Molded-on PUR	Molded-on PUR
No. of wires × conductor cross section	8 × 0.25 mm2 (24 AWG)	8 × 0.25 mm2 (24 AWG)
Type	LIYY-CF11Y	LIYY-CF11Y
Conductor configuration	14 × 0.15 mm	14 × 0.15 mm
Outer diameter	6.6 ±0.2 mm	6.6 ±0.2 mm
Min. bending radius	dynamic 4 × D, static 3 × D	dynamic 4 × D, static 3 × D

Ordering code for available lengths:

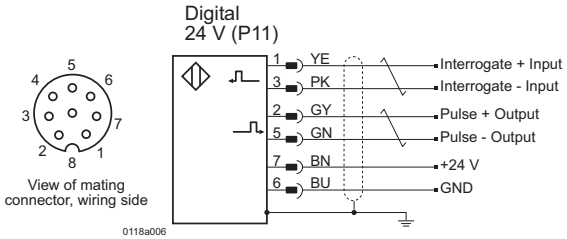
02 = Length 2 m 10 = Length 10 m
05 = Length 5 m 15 = Length 15 m

Analog (A11) Wiring



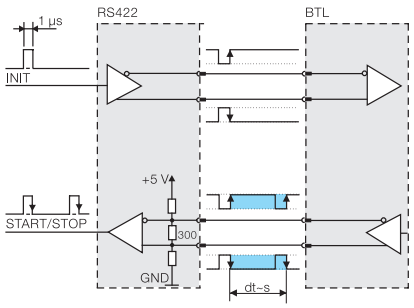
Pins 4 and 8 must remain unconnected

Digital (P11) Wiring



Pins 4 and 8 must remain unconnected

Block diagram of P interface



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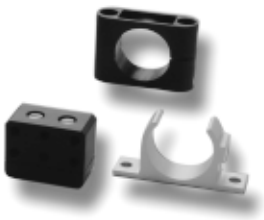
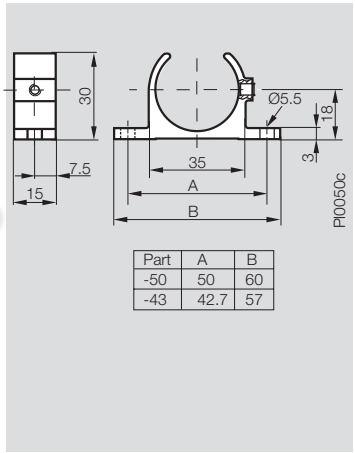
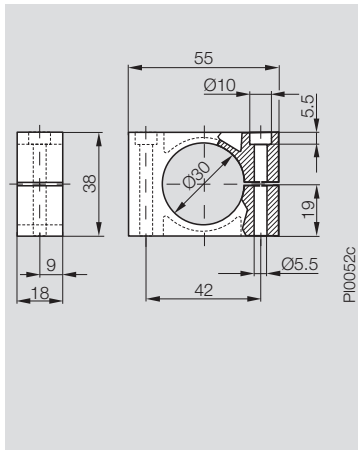
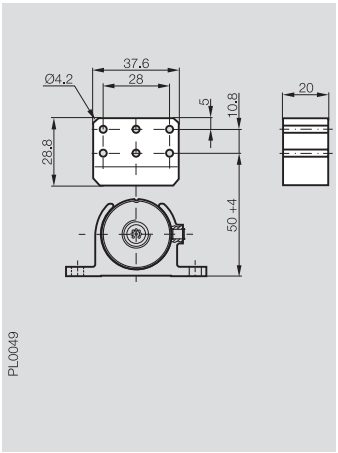
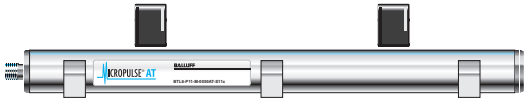
Product Type	Mounting Clamp Standard	Mounting Clam Cuff	Magnet Floating
				
Ordering Code	**BTL-6-A-MF01-A-50 BTL-6-A-MF01-A-43**	**BES-30-BS-1**	**BTL-6-A-3800-2**
Material	Aluminum	Plastic	Plastic
Weight	16 g	21 g	40 g

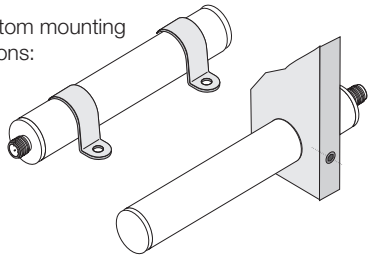
Part	A	B
-50	50	60
-43	42.7	57



When extreme shock and vibration are present, spacing mounting clamps every 250 mm is recommended.

Installation Note:
The BTL6-A-3800-2 magnet can be operated at a distance of 4...8 mm from the top surface of the profile housing. Together with the BTL6-A-MF01-A50 mounting clamps the mechanical installation is compatible with the BTL5-...-P-S 32 using BTL5-P-3800-2 or BTL5-P-5500-2 magnets. This means for example that long stroke lengths or transducers with a bus interface can be inter-changed without making any mechanical modifications.

Custom mounting options:



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For more information on Balluff transducers or our full line of sensor solutions, visit our product center online: http://www.balluff.com/micropulse


Sensors


Linear Transducers


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Sensitive by nature
Tough by design

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