

## 2018 catalog

For CO<sub>2</sub> and fiber laser consumables Replacement parts suitable for Bystronic<sup>®</sup>



## Centricut delivers

- OEM quality nozzles, ceramics and optics
- Technical and application support from our OEM-trained technicians
- 100% satisfaction guarantee

## CO<sub>2</sub> and fiber laser nozzles

## Nozzle options

All Centricut nozzles are engineered and manufactured to the highest standards. Select the OEM quality nozzle best suited for your application needs

#### Copper

Most commonly used nozzle offering good durability and nozzle life. Primary nozzle type for fiber lasers.

#### Chrome plated

Shiny, mirror-like finish provides increased spatter resistance, improved durability and longer life than copper nozzles. Not recommended for use on fiber lasers.

Look for CP in the part number to identify a chrome plated nozzle

#### Hard chrome plated

Premium nozzles offering the highest level of durability and longest nozzle life. These nozzles are not as shiny as chrome plated and have a dull appearance. Not recommended for use on fiber lasers.

Look for HCP in the part number to identify a hard chrome nozzle.

CP (chrome plated)	Nozzles plated with chrome for increased durability. These nozzles are easier to clean, resist damage due to 'tip-ups' and have better spatter resistance over non-plated nozzles. For use in all laser cutting applications.
Conical	Conical internal geometry for high pressure, non-ferrous cutting applications using nitrogen, air or argon.
Cylindrical	Cylindrical internal geometry for low pressure, mild steel cutting applications using oxygen.
Double	Insert pressed into a standard cylindrical nozzle for improved edge quality, laminar gas flow and spatter resistance. Primarily used in mild steel applications.
HCP (hard chrome plated)	Enhanced durability chrome plated nozzles. These nozzles are easier to clean, resist damage due to 'tip-ups' and have better spatter resistance over non-plated nozzles. For use in all laser cutting applications.
HP (high pressure) HD (high density)	Conical style nozzle for high pressure, non-ferrous cutting applications using nitrogen, air or argon.
Inner	Also referred to as a 'nozzle insert'. Works in conjunction with an outer nozzle to create a double nozzle. Primarily used in mild steel applications.
Low pressure	Cylindrical style nozzle for low pressure, mild steel cutting applications using oxygen.
Outer	Works in conjunction with an inner nozzle to create a double nozzle. Primarily used in mild steel applications.
Shower	Nozzles with a center orifice surrounded by smaller jets. The smaller jets focus the assist gas into the kerf, creating improved edge quality and the ability to cut thicker material. Primarily used in mild steel applications.



## CO<sub>2</sub> and fiber laser optics

#### Optics key

Lens			
MEN	Meniscus		
PLX	Plano-convex		
MTD	Mounted		
Not MTD	Not mounted		
PO	Plano		
MP5 or ULA	Ultra low absorption		
AR	Anti-reflection		
ZNSE	Sinc-selinide		
FS	Fused silica		
DIA	Diameter		
FL	Focal length		
ET	Edge thickness		
WD	Working distance		

#### How to handle optics

Follow these easy steps, when cleaning or changing your optic, to help maximize the life and performance of your lens

- Avoid touching coated surfaces of the lens and hold the optic by its sides
- Wear powder-free finger cots or latex gloves when handling
- Do not use any tools or sharp objects when handling the optic or when removing it from its packaging
- Ensure the work surface is clean and free of oils, grease and dirt
- Do not place the optic on hard surfaces as they scratch easily
- Once the optic has been unpacked, carefully place it on the lens tissue in which it was originally wrapped

#### **Optics disposal**

It is important to dispose of used laser optics at a licensed industrial waste facility which is in compliance with all local, state, and federal regulations. If you don't have access to a licensed industrial waste facility, and purchased your laser optics through Centricut, you may return them to Centricut for proper disposal. This service is only available to Centricut customers.

#### All optics returned to Centricut must:

- Include return authorization and invoice numbers
- Be sealed in a plastic bag to minimize any hazards
- Remove excess ZnSe powder prior to sealing

\*Acceptance of goods will be refused if not packaged correctly or if the return authorization number isn't included





## Bystronic<sup>®</sup>









#### Consumables

	Centricut part number	Esse A part number	Reference number	Description	Pkg atv
	BY310-4277X	L30674	3-04277, HK08	BY-Nozzle HD, 0.8 mm (10 pk)*	10
	BY310-1910X	L3072	3-01910, HK10	BY-Nozzle HD, 1.0 mm (10 pk)*	10
	BY310-1911X	L30121	3-01911, HK12	BY-Nozzle HD, 1.25 mm (10 pk)*	10
	BY310-1912X	L3073	3-01912, HK15	BY-Nozzle HD, 1.5 mm (10 pk)*	10
1	BY310-1913X	L30122	3-01913, HK17	BY-Nozzle HD, 1.75 mm (10 pk)*	10
	BY310-1910CPX	L3072X	3-01910, HK10	BY-Nozzle HD, 1.0 mm CP (10 pk)*	10
	BY310-1911CPX	L30121X	3-01911, HK12	BY-Nozzle HD, 1.25 mm CP (10 pk)*	10
	BY310-1912CPX	L3073X	3-01912, HK15	BY-Nozzle HD, 1.5 mm CP (10 pk)*	10
	BY310-1913CPX	L30122X	3-01913, HK17	BY-Nozzle HD, 1.75 mm CP (10 pk)*	10
	BY310-1914X	L30123	3-01914, HK20	BY-Nozzie HD, 2.0 mm (10 pk)*	10
	BY310-1915X	L30140	3-03854, HK25	BY-Nozzle HD, 2.5 mm (10 pk)*	10
	BY310-6112X	L30265	3-06112, HK30	BY-Nozzle HD, 3.0 mm (10 pk)*	10
	BY310-0035X	L30700	HK35	BY-Nozzle HD, 3.5 mm (10 pk)*	10
2	BY310-0040X	L30701	HK40	BY-Nozzle HD, 4.0 mm (10 pk)*	10
	BY310-1914CPX	L30123X	3-01914, HK20	BY-Nozzle HD, 2.0 mm CP (10 pk)*	10
	BY310-1915CPX	L30140X	3-03854, HK25	BY-Nozzle HD, 2.5 mm CP (10 pk)*	10
	BY310-6112CPX	L30265X	3-06112, HK30	BY-Nozzle HD, 3.0 mm CP (10 pk)*	10
	BY310-0040CPX	L30701X	HK40	BY-Nozzle HD, 4.0 mm CP (10 pk)*	10



Replacement parts suitable for: Bystronic®

#### Consumables

	Centricut part number	Esse A part number	Reference number	Description	Pkg atv
	BY310-4273X	L3083	3-04273, K08	BY-Nozzle, 0.8 mm (10 pk)*	10
	BY310-1905X	L30116	3-01905, K10	BY-Nozzle, 1.0 mm (10 pk)*	10
	BY310-1906X	L30117	3-01906, K12	BY-Nozzle, 1.25 mm (10 pk)*	10
	BY310-1907X	L30118	3-01907, K15	BY-Nozzle, 1.5 mm (10 pk)*	10
	BY310-1908X	L30119	3-01908, K17	BY-Nozzle, 1.75 mm (10 pk)*	10
	BY310-1909X	L30120	3-01909, K20	BY-Nozzle, 2.0 mm (10 pk)*	10
	BY310-4274X	L30675	3-04274, K25	BY-Nozzle, 2.5 mm (10 pk)*	10
•	BY310-4275X	L30678	3-04275, K30	BY-Nozzle, 3.0 mm (10 pk)*	10
3	BY310-4273CPX	L3083X	3-04273, K08	BY-Nozzle, 0.8 mm CP (10 pk)*	10
	BY310-1905CPX	L30116X	3-01905, K10	BY-Nozzle, 1.0 mm CP (10 pk)*	10
	BY310-1906CPX	L30117X	3-01906, K12	BY-Nozzle, 1.25 mm CP (10 pk)*	10
	BY310-1907CPX	L30118X	3-01907, K15	BY-Nozzle, 1.5 mm CP (10 pk)*	10
	BY310-1908CPX	L30119X	3-01908, K17	BY-Nozzle, 1.75 mm CP (10 pk)*	10
	BY310-1909CPX	L30120X	3-01909, K20	BY-Nozzle, 2.0 mm CP (10 pk)*	10
	BY310-4274CPX	L30675X	3-04274, K25	BY-Nozzle, 2.5 mm CP (10 pk)*	10
	BY310-2475CPX	L30678X	3-04275, K30	BY-Nozzle, 3.0 mm CP (10 pk)*	10
	BY310-6058X	L301363	3-16058, NK10-15	BY-Nozzle double, 1.0 mm (10 pk)*	10
	BY310-6059X	L301364	3-16059, NK12-15	BY-Nozzle double, 1.25 mm (10 pk)*	10
	BY310-6060X	L301365	3-16060, NK15-15	BY-Nozzle double, 1.5 mm (10 pk)*	10
	BY310-4317X	L301366	3-14317, NK17-15	BY-Nozzle double, 1.75 mm (10 pk)*	10
	BY310-0005X	L30604	3-14318, NK20-15	BY-Nozzle double, 2.0 mm (10 pk)*	10
	BY310-0006X	L30605	3-14319, NK25-15	BY-Nozzle double, 2.5 mm (10 pk)*	10
	BY310-6256X	L30612	3-16256, NK25-20	BY-Nozzle double, 2.5 mm/Inner 2.0 mm (10 pk)*	10
	BY310-6061X	L30613	3-16061, NK30-17	BY-Nozzle double, 3.0 mm/Inner 1.75 mm (10 pk)*	10
	BY310-0007X	L30606	3-16257, NK30-20	BY-Nozzle double, 3.0 mm (10 pk)*	10
4	BY310-3530X	L30607	NK35-30	BY-Nozzle double, 3.5 mm/Inner 3.0 mm (10 pk)*	10
4	BY310-6058CPX	L301363X	3-16058, NK10-15	BY-Nozzle double, 1.0 mm CP (10 pk)*	10
	BY310-6059CPX	L301364X	3-16059, NK12-15	BY-Nozzle double, 1.25 mm CP (10 pk)*	10
	BY310-6060CPX	L301365X	3-16060, NK15-15	BY-Nozzle double, 1.5 mm CP (10 pk)*	10
	BY310-4317CPX	L301366X	3-14317, NK17-15	BY-Nozzle double, 1.75 mm CP (10 pk)*	10
	BY310-0005CPX	L30604X	3-14318, NK20-15	BY-Nozzle double, 2.0 mm CP (10 pk)*	10
	BY310-0006CPX	L30605X	3-14319, NK25-15	BY-Nozzle double, 2.5 mm CP (10 pk)*	10
	BY310-6256CPX	L30612X	3-16256, NK25-20	BY-Nozzle double, 2.5 mm/Inner 2.0 mm CP (10 pk)*	10
	BY310-6061CPX	L30613X	3-16061, NK30-17	BY-Nozzle double, 3.0 mm/Inner 1.75 mm CP (10 pk)*	10
	BY310-0007CPX	L30606X	3-16257, NK30-20	BY-Nozzle double, 3.0 mm CP (10 pk)*	10
	BY310-3530CPX	L30607X	NK35-30	BY-Nozzle double, 3.5 mm/Inner 3.0 mm CP (10 pk)*	10
5	BY327-3210	AL418	7023207, 7023208	BY-Water connector set	1
6	BY328-3207	AL416	7023207	BY-Water connector, male	1
7	BY328-3208	AL417	7023208	BY-Water connector, female	1

\*Available in single packs. To order single packs, remove the 'X' at the end of the part number (e.g. AM123-4567X would be AM123-4567). For nozzle bodies and associated parts see pages 24-27.



## Bystronic<sup>®</sup>







#### Consumables

Distribut         Distribut         Distribut         Distribut         Part number         Distribut         Part number         Distribut         Part number         Part		Contrigut	Feen A	Reference		Pka
PY310-0007X         L38000         3-16858, NK10-15         DY-Nazzle double, 1.0 mm (10 pk)*         10           BY310-0002X         L38001         3-16858, NK12-15         DY-Nazzle double, 1.25 mm (10 pk)*         10           BY310-0003X         L36603         3-16858, NK12-15         DY-Nazzle double, 1.75 mm (10 pk)*         10           BY310-0004X         L36603         3-16837, NK17-15         DY-Nazzle double, 1.75 mm (10 pk)*         10           BY310-0004X         L36600X         3-16688, MK12-15         DY-Nazzle double, 1.55 mm CP (10 pk)*         10           BY310-0004CPX         L36600X         3-16688, MK17-15         DY-Nazzle double, 1.55 mm CP (10 pk)*         10           BY311-0004CPX         L36600X         3-16688, MK17-15         DY-Nazzle double, 1.55 mm CP (10 pk)*         10           BY311-0004CPX         L36603X         3-14837, MK7-15         DY-Nazzle double, 1.55 mm CP (10 pk)*         10           BY311-0004CPX         L36603X         3-14837, MK7-15         DY-Nazzle, 1.55 mm CP (10 pk)*         10           BY311-0004CPX         L36603X         3-14837, MK7-15         DY-Nazzle, 1.55 mm CP (10 pk)*         10           BY311-0004CPX         L36603X         3-14837, MK7-15         DY-Nazzle, 1.55 mm (10 pk)*         10           BY311-0004CPX         L36010 <td< td=""><td></td><td>nart number</td><td>nart numher</td><td>numher</td><td>Description</td><td>ntv</td></td<>		nart number	nart numher	numher	Description	ntv
BY310-0002X         L30801         3-16059, MK12-15         DY Muzzle double, 1.5 mm (10 pk)*         00           BY310-0013X         L30801         3-16059, MK12-15         DY Muzzle double, 1.5 mm (10 pk)*         10           BY310-0016PX         L30601X         3-16059, MK12-15         DY-Muzzle double, 1.5 mm (10 pk)*         10           BY310-0016PX         L30601X         3-16059, MK12-15         DY-Muzzle double, 1.5 mm (D pk)*         10           BY310-0016PX         L30601X         3-16059, MK15-15         DY-Muzzle double, 1.5 mm CP (10 pk)*         10           BY310-0016PX         L30603X         3-14317, MK17-15         DY-Muzzle double, 1.5 mm CP (10 pk)*         10           BY310-0016PX         L30603X         3-14317, MK17-15         DY-Muzzle double, 1.5 mm CP (10 pk)*         10           BY310-0046PX         L30603X         3-14317, MK17-15         DY-Muzzle double, 1.5 mm CP (10 pk)*         10           BY310-0046PX         L30603X         3-14317, MK17-15         DY-Muzzle double, 1.5 mm CP (10 pk)*         10           BY310-0016PX         L30603         3-01885, 12         DY-Muzzle double, 1.5 mm CP (10 pk)*         10           BY310-1036         S-01885, 12         DY-Muzzle double, 1.5 mm (10 pk)*         10         10           BY310-13036         S-01887, 17         D		BV310-0001X		3-16058 NK10-15	BV-Nozzle double, 1.0 mm (10 nk)*	10
Bits         Discost         Discost <thdiscost< th=""> <thdiscost< th=""> <thdisc< td=""><td rowspan="8">1</td><td>BV310-0002X</td><td>1 30601</td><td>3-16059 NK12-15</td><td>BV-Nozzle double, 1.95 mm (10 pk)*</td><td>10</td></thdisc<></thdiscost<></thdiscost<>	1	BV310-0002X	1 30601	3-16059 NK12-15	BV-Nozzle double, 1.95 mm (10 pk)*	10
PY310-0004X         L30603         314317, NK17-15         BY-Mazzie double, 1.75 mm (10 pk)*         0           PY310-001CPX         L30600X         316056, NK10-15         BY-Mazzie double, 1.75 mm (10 pk)*         10           BY310-000CPX         L30600X         316056, NK12-15         BY-Mazzie double, 1.5 mm CP (10 pk)*         10           BY310-000CPX         L30602X         316056, NK12-15         BY-Mazzie double, 1.5 mm CP (10 pk)*         10           BY310-000CPX         L30602X         316056, NK17-15         BY-Mazzie double, 1.5 mm CP (10 pk)*         10           BY310-000CPX         L30602X         316056, NK17-15         BY-Mazzie double, 1.5 mm CP (10 pk)*         10           BY310-1000CPX         L30603X         314317, NK17-15         BY-Mazzie, 1.5 mm (10 pk)*         10           BY310-100CPX         L30100         3-01895, 12         BY-Mazzie, 1.5 mm (10 pk)*         10           BY310-1098X         L30101         3-01892, 12         BY-Mazzie, 1.5 mm (10 pk)*         10           BY310-1098X         L30102         3-04872, 25         BY-Mazzie, 2.5 mm (10 pk)*         10           BY310-1098X         L30103         3-04972, 25         BY-Mazzie, 2.5 mm (10 pk)*         10           BY310-1098X         L30103         3-049275, R06         BY-Mazzie, 40, 0, 10 mm (10		BV310-0003X	1 30602	3-16060, NK15-15	BV-Nozzle double, 1.5 mm (10 pk)*	10
1         0731-0001CPX         L3060X         3-16058, NK10-15         DF-Nazzie double, 1.0 mm CP (10 µk)*         10           BY310-0002CPX         L30601X         3-16056, NK12-15         DF-Nazzie double, 1.25 mm CP (10 µk)*         10           BY310-0002CPX         L30602X         3-16056, NK15-15         DF-Nazzie double, 1.75 mm CP (10 µk)*         10           BY310-0002CPX         L30602X         3-16056, NK15-15         DF-Nazzie double, 1.75 mm CP (10 µk)*         10           BY310-0002CPX         L30603X         3-14317, NK17-15         DF-Nazzie double, 1.75 mm CP (10 µk)*         10           BY310-1903CPX         L3098         3-01985, 12         DF-Nazzie, 1.75 mm (10 µk)*         10           BY310-1903K         L3099         3-01985, 12         DF-Nazzie, 1.75 mm (10 µk)*         10           BY310-1903K         L3010         3-01985, 15         DF-Nazzie, 2.75 mm (10 µk)*         10           BY310-1903K         L30676         3-04272, 5         DF-Nazzie, 2.75 mm (10 µk)*         10           BY310-1903K         L3088         3-01989, 110         DF-Nazzie, 2.75 mm (10 µk)*         10           BY310-1903K         L30103         3-01901, 115         DF-Nazzie HD, 1.5 mm (10 µk)*         10           BY310-1903K         L30105         3-01902, 117         DF-Nazz		BY310-0004X	130603	3-14317 NK17-15	BY-Nozzle double, 1.5 mm (10 pk)*	10
BY310-D032CPX         L3860TX         316059, NK12-15         BY14-b226 double, 125 mm CP (10 pk)*         10           BY310-D032CPX         L3060ZX         316060, NK15-15         BY14azzle double, 125 mm CP (10 pk)*         10           BY310-D004PX         L3060ZX         316060, NK15-15         BY14azzle double, 125 mm CP (10 pk)*         10           BY310-D004PX         L3060ZX         316060, NK17-15         BY14azzle double, 125 mm CP (10 pk)*         10           BY310-1004PX         L3001X         316183, 12         BY14azzle, 125 mm (10 pk)*         10           BY310-1034X         L30101         3-0189, 12         BY14azzle, 125 mm (10 pk)*         10           BY310-1034X         L30101         3-0189, 12         BY14azzle, 125 mm (10 pk)*         10           BY310-1034X         L30101         3-0189, 17         BY14azzle, 125 mm (10 pk)*         10           BY310-1034X         L30673         3-04272, 25         BY14azzle, 125 mm (10 pk)*         10           BY310-1034X         L30673         3-04273, 100         BY14azzle H0, 15 mm (10 pk)*         10           BY310-1034X         L30673         3-04272, 51         BY14azzle H0, 15 mm (10 pk)*         10           BY310-1034X         L30673         3-04273, 100         BY14azzle H0, 15 mm (10 pk)*         10		BY310-0001CPX	130600X	3-16058 NK10-15	BY-Nazzle double, 1.0 mm CP (10 pk)*	10
BY310-003CPX         L3662X         316800, NK15-15         BY1-Mazze double, 1.75 mm CP (10 pb)*         10           BY310-004CPX         L36603X         3-1680, NK15-15         BY-Mazze double, 1.75 mm CP (10 pb)*         10           BY310-1984X         L3098         3-01885, 12         BY-Mazze double, 1.75 mm (10 pb)*         10           BY319-1895X         L3099         3-01885, 15         BY-Mazze, 1.25 mm (10 pb)*         10           BY319-1895X         L30100         3-01886, 15         BY-Mazze, 1.25 mm (10 pb)*         10           BY319-1895X         L30101         3-01886, 20         BY-Mazze, 20 mm (10 pb)*         10           BY319-1895X         L30102         3-01888, 20         BY-Mazze, 20 mm (10 pb)*         10           BY319-1895X         L30012         3-01888, 20         BY-Mazze, 20 mm (10 pb)*         10           BY319-1895X         L30673         3-04272, 25         BY-Mazze, 20 mm (10 pb)*         10           BY319-1900X         L30103         3-01901, H15         BY-Mazze H0, 1.5 mm (10 pb)*         10           BY319-1900X         L30103         3-01901, H15         BY-Mazze H0, 1.5 mm (10 pb)*         10           BY319-1900X         L30103         3-01901, H15         BY-Mazze H0, 1.5 mm (10 pb)*         10           BY319		BY310-0002CPX	130601X	3-16059 NK12-15	BY-Nazzle double, 1.95 mm CP (10 pk)*	10
BY310-0004CPX         L30603X         3-14437, NK17-15         BY-Nezzle double, 7.75 mm CP (10 pk)*         10           BY310-1894X         L3089         3-01894, 10         BY-Nezzle double, 7.75 mm CP (10 pk)*         10           BY310-1895X         L3099         3-01896, 12         BY-Nezzle, 12 mm (10 pk)*         10           BY310-1895X         L30100         3-01896, 15         BY-Nezzle, 125 mm (10 pk)*         10           BY310-1895X         L30101         3-01897, 17         BY-Nezzle, 125 mm (10 pk)*         10           BY310-1895X         L30102         3-01896, 20         BY-Nezzle, 22 mm (10 pk)*         10           BY310-4272X         L30676         3-04272, 25         BY-Nezzle, 10, 0.8 mm (10 pk)*         10           BY310-4275X         L30673         3-04275, H08         BY-Nezzle HD, 1.25 mm (10 pk)*         10           BY310-4275X         L30673         3-04272, 25         BY-Nezzle HD, 1.25 mm (10 pk)*         10           BY310-4275X         L30673         3-04272, 54         BY-Nezzle HD, 1.25 mm (10 pk)*         10           BY310-4275X         L30673         3-04272, 54         BY-Nezzle HD, 1.25 mm (10 pk)*         10           BY310-4276X         L30105         3-01902, H17         BY-Nezzle HD, 2.5 mm (10 pk)*         10		BY310-0003CPX	1 30602X	3-16060, NK15-15	BV-Nozzle double, 1.5 mm CP (10 pk)*	10
BY31-1984X         L3098         3-1168/H,10         BY-Nozzi, 1.0 mm (10 pk)*         10           BY31-1895X         L3099         3-01855, 12         BY-Nozzi, 1.0 mm (10 pk)*         10           BY31-1895X         L30100         3-01895, 15         BY-Nozzi, 1.75 mm (10 pk)*         10           BY31-1895X         L30101         3-01897, 17         BY-Nozzi, 1.75 mm (10 pk)*         10           BY31-1897         L30102         3-01898, 20         BY-Nozzi, 1.75 mm (10 pk)*         10           BY31-1897         L30102         3-01898, 20         BY-Nozzi, 25 mm (10 pk)*         10           BY31-1898X         L30673         3-04275, H08         BY-Nozzi, 42 mm (10 pk)*         10           BY31-1998X         L30673         3-04275, H08         BY-Nozzi, H0, 25 mm (10 pk)*         10           BY31-1910X         L30103         3-01890, H12         BY-Nozzi, H0, 25 mm (10 pk)*         10           BY31-1910X         L30104         3-01802, H17         BY-Nozzi, H0, 25 mm (10 pk)*         10           BY31-1910X         L30105         3-01802, H17         BY-Nozzi, H0, 25 mm (10 pk)*         10           BY31-1910X         L30104         3-01802, H17         BY-Nozzi, H0, 25 mm (10 pk)*         10           BY31-1910X         L30677         <		BY310-0004CPX	130603X	3-14317 NK17-15	BY-Nozzle double, 1.75 mm CP (10 pk)*	10
BY319-1985X         Lisbe Lisbe Lisbe Lisbe BY319-1985X         Lisbe Lisbe Lisbe Lisbe Lisbe Lisbe Lisbe BY319-1985X         Lisbe Lisbe Lisbe Lisbe Lisbe Lisbe Lisbe BY319-1985X         Lisbe		BY319-1894X	13098	3-01894 10	BY-Nozzle 10 mm (10 nk)*	10
Construction         Construction<		BY319-1895X	13099	3-01895 12	BY-Nozzle, 1.25 mm (10 pk)*	10
BY319-1887         L30101         3-01887, 17         BY-Mazzle, 17.5 mm (10 pk)*         10           BY319-1887         L30102         3-01897, 20         BY-Mazzle, 2.5 mm (10 pk)*         10           BY319-4272X         L30673         3-04272, 25         BY-Mazzle, 2.5 mm (10 pk)*         10           BY319-4275X         L30673         3-04272, 25         BY-Mazzle 10, 0.8 mm (10 pk)*         10           BY319-4275X         L30673         3-04272, 25         BY-Mazzle 10, 0.8 mm (10 pk)*         10           BY319-189X         L3088         3-01899, H10         BY-Mazzle 10, 0.1 mm (10 pk)*         10           BY319-190X         L30104         3-01900, H12         BY-Mazzle 10, 1.2 mm (10 pk)*         10           BY319-190X         L30104         3-01902, H17         BY-Mazzle 10, 2.0 mm (10 pk)*         10           BY319-190X         L30104         3-01902, H17         BY-Mazzle 10, 2.0 mm (10 pk)*         10           BY319-190X         L30105         3-01902, H17         BY-Mazzle 10, 2.0 mm (10 pk)*         10           BY319-100X         L30677         3-04276, H25         BY-Mazzle 10, 2.0 mm (10 pk)*         10           BY319-100X         L30677         3-04276, H25         BY-Mazzle 10, 2.0 mm (10 pk)*         10           BY319-1003X		BY319-1896X	130100	3-01896 15	BY-Nozzle, 1.5 mm (10 pk)*	10
BY319-1888X         L30102         3-01889, 20         BY-Mozzle, 2.0 mm (10 µk)*         10           BY319-4272X         L30676         3-04272, 25         BY-Mozzle, 2.0 mm (10 µk)*         10           BY319-4275X         L30673         3-04272, 25         BY-Mozzle, 2.0 mm (10 µk)*         10           BY319-4275X         L30673         3-04275, H08         BY-Mozzle H0, 1.0 mm (10 µk)*         10           BY319-402X         L30103         3-01900, H12         BY-Mozzle H0, 1.0 mm (10 µk)*         10           BY319-1900X         L30105         3-01900, H12         BY-Mozzle H0, 1.75 mm (10 µk)*         10           BY319-1902X         L30105         3-01900, H17         BY-Mozzle H0, 2.0 mm (10 µk)*         10           BY319-1902X         L30105         3-01900, H17         BY-Mozzle H0, 2.0 mm (10 µk)*         10           BY319-1902X         L30105         3-01900, H12         BY-Mozzle H0, 2.0 mm (10 µk)*         10           BY319-402X         L30677         3-04276, H25         BY-Mozzle H0, 2.0 mm (10 µk)*         10           BY319-402X         L30678         H30         BY-Mozzle H0, 2.0 mm (10 µk)*         10           BY319-402X         L30678         J30-04276, H25         BY-Mozzle H0, 2.0 mm (10 µk)*         10           BY319-4276X		BY319-1897	130101	3-01897 17	BY-Nozzle, 175 mm (10 pk)*	10
BY319-4272X         L30676         3-04272, 25         BY-Mozzle, 25 mm (10 pk)*         10           BY319-4275X         L30673         3-0427, 108         BY-Mozzle, 10, 10 mp (10 pk)*         10           BY319-1899X         L3088         3-01899, H10         BY-Mozzle H0, 1.8 mm (10 pk)*         10           BY319-1899X         L30103         3-01900, H12         BY-Mozzle H0, 1.25 mm (10 pk)*         10           BY319-1801X         L30104         3-01900, H12         BY-Mozzle H0, 1.75 mm (10 pk)*         10           BY319-1801X         L30105         3-01900, H12         BY-Mozzle H0, 1.75 mm (10 pk)*         10           BY319-1801X         L30106         3-01903, H20         BY-Mozzle H0, 1.75 mm (10 pk)*         10           BY319-1802X         L30106         3-01903, H20         BY-Mozzle H0, 1.5 mm (10 pk)*         10           BY319-1002X         L30677         3-04276, H25         BY-Mozzle H0, 1.0 mm (10 pk)*         10           BY319-1003X         L3068X         3-01899, H10         BY-Mozzle H0, 1.0 mm (10 pk)*         10           BY319-1003X         L3008X         3-01890, H12         BY-Mozzle H0, 1.25 mm (10 pk)*         10           BY319-1030X         L30103X         3-01900, H12         BY-Mozzle H0, 1.25 mm (10 pk)*         10		BY319-1898X	130102	3-01898 20	BY-Nozzle, 2.0 mm (10 nk)*	10
BY319-4275X         L30673         3-04275, H08         BY-Nozzle HD, 0.8 mm (10 pk)*         10           PX319-1899X         L3088         3-01899, H10         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1990X         L30103         3-01900, H12         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1901X         L30104         3-01901, H15         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1902X         L30105         3-01902, H17         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1902X         L30105         3-01903, H20         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-1902X         L30105         3-01902, H17         BY-Nozzle HD, 2.0 mm (10 pk)*         10           BY319-1902X         L300677         3-04276, H25         BY-Nozzle HD, 2.0 mm (10 pk)*         10           BY319-1903X         L30677         H30         BY-Nozzle HD, 1.5 mm (P (10 pk)*         10           BY319-1903X         L30677         H30         BY-Nozzle HD, 1.5 mm (P (10 pk)*         10           BY319-1902CPX         L30103X         3-01902, H17         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1902CPX         L30105X         3-01902, H17         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10		BY319-4272X	1 30676	3-04272, 25	BY-Nozzle, 2.5 mm (10 pk)*	10
BY319-1899X         13088         3-01899, H10         BY-Nozzle HD, 1.0 mm (10 pk)*         10           PY319-1900X         1.30103         3-01900, H12         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1900X         1.30104         3-01901, H15         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1902X         1.30105         3-01902, H17         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1902X         1.30106         3-01903, H20         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-1903X         1.30677         3-04276, H25         BY-Nozzle HD, 3.0 mm (10 pk)*         10           BY319-1899CPX         1.30673         H34276K, H25         BY-Nozzle HD, 3.0 mm (10 pk)*         10           BY319-1899CPX         1.3088X         3-01900, H12         BY-Nozzle HD, 1.0 mm CP (10 pk)*         10           BY319-1899CPX         1.30103X         3-01900, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1890CPX         1.30103X         3-01900, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1902CPX         1.30104X         3-01900, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1902CPX         1.30105X         3-01920, H17         BY-Nozzle HD, 1.5 mm CP (10 pk)*		BY319-4275X	130673	3-04275, H08	BY-Nozzle HD, 0.8 mm (10 pk)*	10
BY319-1900X         L30103         3-01900, H12         BY-Nozzle HD, 1.25 mm (10 pk)*         10           BY319-1901X         L30104         3-01901, H15         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1902X         L30105         3-01902, H17         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1902X         L30106         3-01903, H20         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-1902X         L30106         3-01903, H20         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-1902X         L30677         3-04276, H25         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-1903X         L30679         H30         BY-Nozzle HD, 1.0 mm CP (10 pk)*         10           BY319-1990CPX         L3088X         3-01900, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1900CPX         L30104X         3-01901, H15         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1901CPX         L30105X         3-01902, H17         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-1903CPX         L30673X         3-04276, H25         BY-Nozzle HD, 3.0 mm CP (10 pk)*         10           BY319-1903CPX         L30673X         3-04276, H25         BY-Nozzle HD, 3.0 mm CP (10 pk)*         10		BY319-1899X	L3088	3-01899. H10	BY-Nozzle HD, 1.0 mm (10 pk)*	10
2         BY319-1901X         L30104         3-01901, H15         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1902X         L30105         3-01902, H17         BY-Nozzle HD, 2.0 mm (10 pk)*         10           BY319-1902X         L30106         3-01902, H17         BY-Nozzle HD, 2.0 mm (10 pk)*         10           BY319-1903X         L30677         3-04276, H25         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-1903X         L30679         H30         BY-Nozzle HD, 3.0 mm (10 pk)*         10           BY319-18990CPX         L3088X         3-01990, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-19901CPX         L30103X         3-01900, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-19902CPX         L30103X         3-01901, H15         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-19902CPX         L30104X         3-01902, H17         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-4276CPX         L30105X         3-019276, H25         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1901CPX         L3015X         H30         BY-Nozzle HD, 1.5 mm (10 pk)*         10           BY319-1901CPX         L3015X         L301551         N17-15         BY-Nozzle HD, 1.5 mm (1		BY319-1900X	L30103	3-01900. H12	BY-Nozzle HD, 1.25 mm (10 pk)*	10
2         BY319-1902X         L30105         3-01902, H17         BY-Nozzle HD, 1.75 mm (10 pk)*         10           BY319-1903X         L30106         3-01903, H20         BY-Nozzle HD, 2.0 mm (10 pk)*         10           BY319-1903X         L30677         3-04276, H25         BY-Nozzle HD, 2.0 mm (10 pk)*         10           BY319-0030X         L30679         H30         BY-Nozzle HD, 1.0 mm CP (10 pk)*         10           BY319-1903DX         L30678         S-01900, H12         BY-Nozzle HD, 1.0 mm CP (10 pk)*         10           BY319-1901CPX         L30103X         S-01900, H12         BY-Nozzle HD, 1.25 mm CP (10 pk)*         10           BY319-1901CPX         L30104X         S-01900, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1901CPX         L30104X         S-01900, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1901CPX         L30105X         S-01902, H17         BY-Nozzle HD, 1.75 mm CP (10 pk)*         10           BY319-1901CPX         L30167X         S-01902, H17         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-1901CPX         L30167X         S-01902, H17         BY-Nozzle HD, 1.75 mm (10 pk)*         10           BY319-103CPX         L30167X         S-01902, H17         BY-Nozzle HD, 3.0 mm (10		BY319-1901X	L30104	3-01901. H15	BY-Nozzle HD, 1.5 mm (10 pk)*	10
BY319-1903X         L30106         3-01903, H20         BY-Nozzle HD, 2.0 mm (10 pk)*         10           BY319-4276X         L30677         3-04276, H25         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-0030X         L30679         H30         BY-Nozzle HD, 3.0 mm (10 pk)*         10           BY319-0102X         L30679         H30         BY-Nozzle HD, 3.0 mm (10 pk)*         10           BY319-0102PX         L30103X         3-01899, H10         BY-Nozzle HD, 1.2 mm CP (10 pk)*         10           BY319-1900CPX         L30103X         3-01901, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1902CPX         L30105X         3-01902, H17         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1902CPX         L30105X         3-01902, H17         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-1902CPX         L30677X         3-04276, H25         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-1903CPX         L30677X         3-04276, H25         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-1903CPX         L3015X         N17-15         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-191X         L301252         N15-15         BY-Nozzle double, 1.5 mm (10 pk)*         10      <	2	BY319-1902X	L30105	3-01902, H17	BY-Nozzle HD, 1.75 mm (10 pk)*	10
BY319-4276X         L30677         3-04276, H25         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-0030X         L30679         H30         BY-Nozzle HD, 3.0 mm (10 pk)*         10           BY319-1899CPX         L3088X         3-01899, H10         BY-Nozzle HD, 1.0 mC P' (10 pk)*         10           BY319-1900CPX         L30103X         3-01900, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1901CPX         L30104X         3-01901, H15         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1902CPX         L30167X         3-01902, H17         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1902CPX         L30677X         3-04276, H25         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-1902CPX         L30165X         3-01902, H17         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-1902CPX         L30167X         3-04276, H25         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-1903CPX         L301251         N12-15         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-1715X         L301252         N15-15         BY-Nozzle double, 1.75 mm (10 pk)*         10           BY319-215X         L301254         N20-15         BY-Nozzle double, 2.0 mm (10 pk)*         10		BY319-1903X	L30106	3-01903, H20	BY-Nozzle HD, 2.0 mm (10 pk)*	10
BY319-0030X         L30679         H30         BY-Nozzle HD, 3.0 mm (10 pk)*         10           BY319-1899CPX         L3088X         3-01899, H10         BY-Nozzle HD, 1.0 mm CP (10 pk)*         10           BY319-0900CPX         L30103X         3-01900, H12         BY-Nozzle HD, 1.25 mm CP (10 pk)*         10           BY319-1901CPX         L30104X         3-01900, H12         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1901CPX         L30104X         3-01902, H17         BY-Nozzle HD, 1.75 mm CP (10 pk)*         10           BY319-0300CPX         L3065X         3-01420, H17         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-0300CPX         L30677X         3-04276, H25         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-1215X         L301251         N12-15         BY-Nozzle HD, 2.5 mm (10 pk)*         10           BY319-1215X         L301252         N15-15         BY-Nozzle double, 1.25 mm (10 pk)*         10           BY319-1715X         L301253         N17-15         BY-Nozzle double, 1.75 mm (10 pk)*         10           BY319-2015X         L301254         N20-15         BY-Nozzle double, 2.0 mm (10 pk)*         10           BY319-2015X         L301255         N25-15         BY-Nozzle double, 2.5 mm (10 pk)*         10 </td <td></td> <td>BY319-4276X</td> <td>L30677</td> <td>3-04276, H25</td> <td>BY-Nozzle HD, 2.5 mm (10 pk)*</td> <td>10</td>		BY319-4276X	L30677	3-04276, H25	BY-Nozzle HD, 2.5 mm (10 pk)*	10
BY319-1899CPX         L3088X         3-01899,H10         BY-Nozzle HD, 1.0 nm CP (10 pk)*         10           BY319-0900CPX         L30103X         3-01900,H12         BY-Nozzle HD, 1.25 nm CP (10 pk)*         10           BY319-1901CPX         L30104X         3-01901,H15         BY-Nozzle HD, 1.75 nm CP (10 pk)*         10           BY319-1902CPX         L30105X         3-01902,H17         BY-Nozzle HD, 1.75 nm CP (10 pk)*         10           BY319-4276CPX         L30677X         3-04276,H25         BY-Nozzle HD, 2.5 nm CP (10 pk)*         10           BY319-0300CPX         L30057X         L301251         N12-15         BY-Nozzle HD, 3.0 nm CP (10 pk)*         10           BY319-1215X         L301251         N12-15         BY-Nozzle double, 1.25 nm CP (10 pk)*         10           BY319-1215X         L301252         N15-15         BY-Nozzle double, 1.25 nm (10 pk)*         10           BY319-1215X         L301253         N17-15         BY-Nozzle double, 1.75 nm (10 pk)*         10           BY319-2015X         L301254         N20-15         BY-Nozzle double, 2.5 nm (10 pk)*         10           BY319-2515X         L301255         N25-15         BY-Nozzle double, 2.5 nm (10 pk)*         10           BY319-3020X         L301256         N25-20         BY-Nozzle double, 3.0 nm (10 pk)*		BY319-0030X	L30679	H30	BY-Nozzle HD, 3.0 mm (10 pk)*	10
BY319-0900CPX         L30103X         3-01900, H12         BY-Nozzle HD, 1.25 mm CP (10 pk)*         10           BY319-1901CPX         L30104X         3-01901, H15         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1902CPX         L30105X         3-01902, H17         BY-Nozzle HD, 1.75 mm CP (10 pk)*         10           BY319-4276CPX         L30677X         3-04276, H25         BY-Nozzle HD, 3.0 mm CP (10 pk)*         10           BY319-030CPX         L30679X         H30         BY-Nozzle HD, 3.0 mm CP (10 pk)*         10           BY319-1215X         L301251         N12-15         BY-Nozzle HD, 3.0 mm CP (10 pk)*         10           BY319-1215X         L301252         N15-15         BY-Nozzle double, 1.25 mm (10 pk)*         10           BY319-1715X         L301253         N17-15         BY-Nozzle double, 1.5 mm (10 pk)*         10           BY319-2015X         L301254         N20-15         BY-Nozzle double, 2.0 mm (10 pk)*         10           BY319-2515X         L301255         N25-15         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-3017X         L301256         N25-20         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-3017X         L301257         N30-17         BY-Nozzle double, 3.0 mm (10 pk)*         10		BY319-1899CPX	L3088X	3-01899, H10	BY-Nozzle HD, 1.0 mm CP (10 pk)*	10
BY319-1901CPX         L30104X         3-01901, H15         BY-Nozzle HD, 1.5 mm CP (10 pk)*         10           BY319-1902CPX         L30105X         3-01902, H17         BY-Nozzle HD, 1.75 mm CP (10 pk)*         10           BY319-4276CPX         L30677X         3-04276, H25         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-0030CPX         L3067X         H30         BY-Nozzle HD, 3.0 mm CP (10 pk)*         10           BY319-1215X         L301251         N12-15         BY-Nozzle double, 1.25 mm (10 pk)*         10           BY319-1715X         L301252         N15-15         BY-Nozzle double, 1.5 mm (10 pk)*         10           BY319-1715X         L301253         N17-15         BY-Nozzle double, 1.75 mm (10 pk)*         10           BY319-2015X         L301254         N20-15         BY-Nozzle double, 1.75 mm (10 pk)*         10           BY319-2015X         L301255         N25-15         BY-Nozzle double, 2.0 mm (10 pk)*         10           BY319-2015X         L301256         N25-20         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-3017X         L301256         N25-20         BY-Nozzle double, 3.0 mm (10 pk)*         10           BY319-3020X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10 <t< td=""><td></td><td>BY319-0900CPX</td><td>L30103X</td><td>3-01900, H12</td><td>BY-Nozzle HD, 1.25 mm CP (10 pk)*</td><td>10</td></t<>		BY319-0900CPX	L30103X	3-01900, H12	BY-Nozzle HD, 1.25 mm CP (10 pk)*	10
BY319-1902CPX         L30105X         3-01902, H17         BY-Nozzle HD, 1.75 mm CP (10 pk)*         10           BY319-4276CPX         L30677X         3-04276, H25         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-0030CPX         L30679X         H30         BY-Nozzle HD, 3.0 mm CP (10 pk)*         10           BY319-1033CCPX         L30679X         H30         BY-Nozzle HD, 3.0 mm CP (10 pk)*         10           BY319-1215X         L301251         N12-15         BY-Nozzle double, 1.25 mm (10 pk)*         10           BY319-1715X         L301252         N15-15         BY-Nozzle double, 1.75 mm (10 pk)*         10           BY319-215X         L301253         N17-15         BY-Nozzle double, 2.0 mm (10 pk)*         10           BY319-2015X         L301254         N20-15         BY-Nozzle double, 2.0 mm (10 pk)*         10           BY319-2515X         L301256         N25-20         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-3017X         L301257         N30-17         BY-Nozzle double, 3.0 mm (10 pk)*         10           BY319-3020X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10           BY319-3020X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10		BY319-1901CPX	L30104X	3-01901, H15	BY-Nozzle HD, 1.5 mm CP (10 pk)*	10
BY319-4276CPX         L30677X         3-04276, H25         BY-Nozzle HD, 2.5 mm CP (10 pk)*         10           BY319-0030CPX         L30679X         H30         BY-Nozzle HD, 3.0 mm CP (10 pk)*         10           BY319-1215X         L301251         N12-15         BY-Nozzle double, 1.25 mm (10 pk)*         10           BY319-1515X         L301252         N15-15         BY-Nozzle double, 1.5 mm (10 pk)*         10           BY319-2015X         L301253         N17-15         BY-Nozzle double, 1.75 mm (10 pk)*         10           BY319-2015X         L301254         N20-15         BY-Nozzle double, 2.0 mm (10 pk)*         10           BY319-2015X         L301255         N25-15         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-2515X         L301256         N25-02         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-2515X         L301257         N30-17         BY-Nozzle double, 3.0 mm (10 pk)*         10           BY319-3017X         L301257         N30-17         BY-Nozzle double, 3.0 mm (10 pk)*         10           BY319-3017X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10           4         BY327-3210         AL416         7023207, 7023208         BY-Water connector set         1 <tr< td=""><td></td><td>BY319-1902CPX</td><td>L30105X</td><td>3-01902, H17</td><td>BY-Nozzle HD, 1.75 mm CP (10 pk)*</td><td>10</td></tr<>		BY319-1902CPX	L30105X	3-01902, H17	BY-Nozzle HD, 1.75 mm CP (10 pk)*	10
BY319-0030CPXL30679XH30BY-Nozzle HD, 3.0 mm CP (10 pk)*10BY319-1215XL301251N12-15BY-Nozzle double, 1.25 mm (10 pk)*10BY319-1515XL301252N15-15BY-Nozzle double, 1.5 mm (10 pk)*10BY319-1715XL301253N17-15BY-Nozzle double, 1.75 mm (10 pk)*10BY319-2015XL301254N20-15BY-Nozzle double, 2.0 mm (10 pk)*10BY319-2515XL301255N25-15BY-Nozzle double, 2.5 mm (10 pk)*10BY319-2515XL301256N25-20BY-Nozzle double, 2.5 mm (10 pk)*10BY319-2520XL301256N25-20BY-Nozzle double, 2.5 mm (10 pk)*10BY319-3017XL301257N30-17BY-Nozzle double, 3.0 mm (10 pk)*10BY319-3020XL301258N30-20BY-Nozzle double, 3.0 mm (10 pk)*104BY327-3210AL4187023207, 7023208BY-Water connector set15BY328-3207AL4167023207BY-Water connector, male16BY328-3208AL4177023208BY-Water connector, female1		BY319-4276CPX	L30677X	3-04276, H25	BY-Nozzle HD, 2.5 mm CP (10 pk)*	10
BY319-1215XL301251N12-15BY-Nozzle double, 1.25 mm (10 pk)*10BY319-1515XL301252N15-15BY-Nozzle double, 1.5 mm (10 pk)*10BY319-1715XL301253N17-15BY-Nozzle double, 1.75 mm (10 pk)*10BY319-2015XL301254N20-15BY-Nozzle double, 2.0 mm (10 pk)*10BY319-2515XL301255N25-15BY-Nozzle double, 2.5 mm (10 pk)*10BY319-2515XL301256N25-20BY-Nozzle double, 2.5 mm (10 pk)*10BY319-2520XL301256N25-20BY-Nozzle double, 2.5 mm (10 pk)*10BY319-3017XL301257N30-17BY-Nozzle double, 3.0 mm (10 pk)*10BY319-3020XL301258N30-20BY-Nozzle double, 3.0 mm (10 pk)*10BY319-3020XL301258N30-20BY-Nozzle double, 3.0 mm (10 pk)*10BY328-3207AL4167023207, 7023208BY-Water connector set1BY328-3208AL4177023208BY-Water connector, female1		BY319-0030CPX	L30679X	H30	BY-Nozzle HD, 3.0 mm CP (10 pk)*	10
BY319-1515X BY319-1715XL301252N15-15BY-Nozzle double, 1.5 mm (10 pk)*10BY319-1715XL301253N17-15BY-Nozzle double, 1.75 mm (10 pk)*10BY319-2015XL301254N20-15BY-Nozzle double, 2.0 mm (10 pk)*10BY319-2515XL301255N25-15BY-Nozzle double, 2.5 mm (10 pk)*10BY319-2520XL301256N25-20BY-Nozzle double, 2.5 mm (10 pk)*10BY319-3017XL301257N30-17BY-Nozzle double, 3.0 mm (10 pk)*10BY319-3020XL301258N30-20BY-Nozzle double, 3.0 mm (10 pk)*10ABY327-3210AL4187023207, 7023208BY-Water connector set15BY328-3207AL4167023207BY-Water connector, male16BY328-3208AL4177023208BY-Water connector, female1		BY319-1215X	L301251	N12-15	BY-Nozzle double, 1.25 mm (10 pk)*	10
BY319-1715XL301253N17-15BY-Nozzle double, 1.75 mm (10 pk)*10BY319-2015XL301254N20-15BY-Nozzle double, 2.0 mm (10 pk)*10BY319-2515XL301255N25-15BY-Nozzle double, 2.5 mm (10 pk)*10BY319-2520XL301256N25-20BY-Nozzle double, 2.5 mm (10 pk)*10BY319-3017XL301257N30-17BY-Nozzle double, 3.0 mm (10 pk)*10BY319-3020XL301258N30-20BY-Nozzle double, 3.0 mm (10 pk)*10BY319-3020XL4187023207, 7023208BY-Water connector set1BY328-3207AL4167023207BY-Water connector, male1BY328-3208AL4177023208BY-Water connector, female1		BY319-1515X	L301252	N15-15	BY-Nozzle double, 1.5 mm (10 pk)*	10
BY319-2015X         L301254         N20-15         BY-Nozzle double, 2.0 mm (10 pk)*         10           BY319-2515X         L301255         N25-15         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-2520X         L301256         N25-15         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-2520X         L301256         N25-20         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-3017X         L301257         N30-17         BY-Nozzle double, 3.0 mm (10 pk)*         10           BY319-3020X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10           4         BY327-3210         AL418         7023207, 7023208         BY-Water connector set         1           5         BY328-3207         AL416         7023207         BY-Water connector, male         1           6         BY328-3208         AL417         7023208         BY-Water connector, female         1		BY319-1715X	L301253	N17-15	BY-Nozzle double, 1.75 mm (10 pk)*	10
BY319-2515X         L301255         N25-15         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-2520X         L301256         N25-20         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-2520X         L301257         N30-17         BY-Nozzle double, 3.0 mm (10 pk)*         10           BY319-3020X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10           BY319-3020X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10           4         BY327-3210         AL418         7023207, 7023208         BY-Water connector set         1           5         BY328-3207         AL416         7023207         BY-Water connector, male         1           6         BY328-3208         AL417         7023208         BY-Water connector, female         1	2	BY319-2015X	L301254	N20-15	BY-Nozzle double, 2.0 mm (10 pk)*	10
BY319-2520X         L301256         N25-20         BY-Nozzle double, 2.5 mm (10 pk)*         10           BY319-3017X         L301257         N30-17         BY-Nozzle double, 3.0 mm (10 pk)*         10           BY319-3020X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10           4         BY327-3210         AL418         7023207, 7023208         BY-Water connector set         1           5         BY328-3207         AL416         7023207         BY-Water connector, male         1           6         BY328-3208         AL417         7023208         BY-Water connector, female         1	J	BY319-2515X	L301255	N25-15	BY-Nozzle double, 2.5 mm (10 pk)*	10
BY319-3017X BY319-3020X         L301257         N30-17         BY-Nozzle double, 3.0 mm (10 pk)*         10           4         BY319-3020X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10           4         BY327-3210         AL418         7023207, 7023208         BY-Water connector set         1           5         BY328-3207         AL416         7023207         BY-Water connector, male         1           6         BY328-3208         AL417         7023208         BY-Water connector, female         1		BY319-2520X	L301256	N25-20	BY-Nozzle double, 2.5 mm (10 pk)*	10
BY319-3020X         L301258         N30-20         BY-Nozzle double, 3.0 mm (10 pk)*         10           4         BY327-3210         AL418         7023207, 7023208         BY-Water connector set         1           5         BY328-3207         AL416         7023207         BY-Water connector, male         1           6         BY328-3208         AL417         7023208         BY-Water connector, female         1		BY319-3017X	L301257	N30-17	BY-Nozzle double, 3.0 mm (10 pk)*	10
4         BY327-3210         AL418         7023207, 7023208         BY-Water connector set         1           5         BY328-3207         AL416         7023207         BY-Water connector, male         1           6         BY328-3208         AL417         7023208         BY-Water connector, female         1		BY319-3020X	L301258	N30-20	BY-Nozzle double, 3.0 mm (10 pk)*	10
5         BY328-3207         AL416         7023207         BY-Water connector, male         1           6         BY328-3208         AL417         7023208         BY-Water connector, female         1	4	BY327-3210	AL418	7023207, 7023208	BY-Water connector set	1
6 BY328-3208 AL417 7023208 BY-Water connector, female 1	5	BY328-3207	AL416	7023207	BY-Water connector, male	1
	6	BY328-3208	AL417	7023208	BY-Water connector, female	1

\*Available in single packs. To order single packs, remove the "X' at the end of the part number (e.g. AM123-4567X would be AM123-4567). For nozzle bodies and associated parts see pages 24-27.



## Bystronic<sup>®</sup>



#### Consumables

	Centricut	Esse A	Reference		Pkg
	part number	part number	number	Description	qty
	BY318-1894X	L3014	3-01894, 10	BY-Nozzle, 1.0 mm (10 pk)*	10
	BY318-1895X	L3041	3-01895, 12	BY-Nozzle, 1.25 mm (10 pk)*	10
	BY318-1896X	L3017	3-01896, 15	BY-Nozzle, 1.5 mm (10 pk)*	10
	BY318-1897X	L3042	3-01897, 17	BY-Nozzle, 1.75 mm (10 pk)*	10
1	BY318-1898X	L3033	3-01898, 20	BY-Nozzle, 2.0 mm (10 pk)*	10
	BY318-1899X	L3043	3-01899, H10	BY-Nozzle HD, 1.0 mm (10 pk)*	10
	BY318-1900X	L3016	3-01900, H12	BY-Nozzle HD, 1.25 mm (10 pk)*	10
	BY318-1901X	L3044	3-01901, H15	BY-Nozzle HD, 1.5 mm (10 pk)*	10
	BY318-1902X	L3045	3-01902, H17	BY-Nozzle HD, 1.75 mm (10 pk)*	10
	BY318-1903X	L3046	3-01903, H20	BY-Nozzle HD, 2.0 mm (10 pk)*	10
	BY320-4273X	L3071	3-04273, K08	BY-Nozzle, 0.8 mm (10 pk)*	10
	BY320-1905X	L30107	3-01905, K10	BY-Nozzle, 1.0 mm (10 pk)*	10
	BY320-1906X	L30108	3-01906, K12	BY-Nozzle, 1.25 mm (10 pk)*	10
	BY320-1907X	L30109	3-01907, K15	BY-Nozzle, 1.5 mm (10 pk)*	10
<b>_</b>	BY320-1909X	L30111	3-01909, K20	BY-Nozzle, 2.0 mm (10 pk)*	10
2	BY320-1910X	L3089	3-01910, HK10	BY-Nozzle HD, 1.0 mm (10 pk)*	10
	BY320-1911X	L30112	3-01911, HK12	BY-Nozzle HD, 1.25 mm (10 pk)*	10
	BY320-1912X	L30113	3-01912, HK15	BY-Nozzle HD, 1.5 mm (10 pk)*	10
	BY320-1913X	L30114	3-01913, HK17	BY-Nozzle HD, 1.75 mm (10 pk)*	10
	BY320-1914X	L30115	3-01914, HK20	BY-Nozzle HD, 2.0 mm (10 pk)*	10
3	BY327-3210	AL418	7023207, 7023208	BY-Water connector set	1
4	BY328-3207	AL416	7023207	BY-Water connector, male	1
5	BY328-3208	AL417	7023208	BY-Water connector, female	1

\*Available in single packs. To order single packs, remove the 'X' at the end of the part number (e.g. AM123-4567X would be AM123-4567). For nozzle bodies and associated parts see pages 24-27.

Centricut is not affiliated with the named manufacturers. Reference to machines, parts, descriptions, and model numbers are for convenience in verifying compatibility only. All parts are made by or for Centricut and are not made by the referenced manufacturers (unless expressly indicated). Centricut is a registered trademark of Hypertherm, Inc. All other trademarks are the properties of their respective owners.

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## Bystronic<sup>®</sup>



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#### Consumables

	Centricut	Esse A	Reference		Pkg
	part number	part number	number	Description	qty
1	BY328-4061	AL450	10034061	BY-Nozzle holder BY-Nozzle adapter	
2	BY328-6030	AL451	10046030	BY-Nozzle adapter	
3	BY328-1133	AL452	10051133	BY-Nozzle adapter MSB	
4	BY328-4099	AL449	10064099	BY-Nozzle body	
5	BY328-9016	AL441	10046025, 08-12-04-9016	BY-Isolator ring, ceramic	1
6	BY310-0398	AL398		BY-CL nut	1
	BY310-8529X	L301660	10048529, HK08	BY-Nozzle, 0.8 mm (10 pk)*	10
	BY310-5266X	L301661	10035266, HK10	BY-Nozzle, 1.0 mm (10 pk)*	10
	BY310-5267X	L301662	10035267, HK12	BY-Nozzle, 1.2 mm (10 pk)*	10
	BY310-5268X	L301663	10035268, HK15	BY-Nozzle, 1.5 mm (10 pk)*	10
7	BY310-5269X	L301664	10035269, HK17	BY-Nozzle, 1.7 mm (10 pk)*	10
	BY310-5270X	L301665	10035270, HK20	BY-Nozzle, 2.0 mm (10 pk)*	10
	BY310-5271X	L301666	10035271, HK25	BY-Nozzle, 2.5 mm (10 pk)*	10
	BY310-5272X	L301667	10035272, HK30	BY-Nozzle, 3.0 mm (10 pk)*	10
	BY310-9744X	L301668	10049744, HK35	BY-Nozzle, 3.5 mm (10 pk)*	10
	BY310-9747X	L301670	10049747, NK10-15	BY-Nozzle double, 1.0 mm (10 pk)*	10
	BY310-5275X	L301671	10035275, NK12-15	BY-Nozzle double, 1.2 mm (10 pk)*	10
	BY310-5278X	L301672	10035278, NK15-15	BY-Nozzle double, 1.5 mm (10 pk)*	10
	BY310-5290X	L301673	10035290, NK17-15	BY-Nozzle double, 1.7 mm (10 pk)*	10
	BY310-5292X	L301674	10035292, NK20-15	BY-Nozzle double, 2.0 mm (10 pk)*	10
	BY310-5294X	L301675	10035294, NK25-15	BY-Nozzle double, 2.5 mm (10 pk)*	10
ð	BY310-5296X	L301676	10035296, NK25-20	BY-Nozzle double, 2.5 mm/Inner 2.0 mm (10 pk)*	10
	BY310-5298X	L301677	10035298, NK30-17	BY-Nozzle double, 3.0 mm/Inner 1.7 mm (10 pk)*	10
	BY310-5301X	L301678	10035301, NK30-20	BY-Nozzle double, 3.0 mm (10 pk)*	10
	BY310-5302X	L301679	10035303, NK35-30	BY-Nozzle double, 3.5 mm (10 pk)*	10
	BY310-8946X NEW	L301680	10068496, NK35-17	BY-Nozzle double, 3.5 mm (10 pk)*	10
	BY310-8948X NEW	L301681	10068496, NK40-17	BY-Nozzle double, 4.0 mm (10 pk)*	10
_	BY310-6332CP NEW	L1683XH	10066332,35H	BY-Nozzle, 3.5 mm CP	1
9	BY310-8494CP NEW	L1684XH	10068494,50H	BY-Nozzle, 5.0 mm CP	1
10	BY310-1682	L1682	10039202	BY-Nozzle centering, 2.0 mm	1

\*Available in single packs. To order single packs, remove the 'X' at the end of the part number (e.g. AM123-4567X would be AM123-4567)



## Bystronic<sup>®</sup>



#### Consumables

	Centricut part number	Esse A part number	Reference number	Description	Pkg qty
1	BY328-5530	AL26	3-05530	BY-Scanner	1
2	BY328-2015	AL5	2-01262	BY-Scanner	1
3	BY328-0015	AL252	2-02015	BY-Scanner	1
4	BY328-2016	AL251	2-02016	BY-Ball scanner	1
5	BY328-3137	AL24	4-03137	BY-Pin (5 pcs)	5
6	BY328-3136	AL25	4-03136	BY-Knurled screw	1
7	BY328-0324	AL1	4-00324	BY-Knurled screw	1
8	BY328-9001	AL208	3-09001	BY-Cross jet screw	1
9	BY328-2291	AL188	3-02291	BY-Nozzle body	1
10	BY328-5497	AL102	3-05497	BY-Nozzle body, copper	1
11	BY328-3663-T	AL206	3-03663-T	BY-Disc, PTFE* (only)	1
12	BY328-3663-C	AL205	3-03663-C	BY-Shield	1
	BY328-1300	AL225	3141300	BY-O-ring	1
10	BY328-1122	AL226	3141122	BY-O-ring	1
13	BY328-0236		3140236	BY-O-ring	1
	BY328-0820	AL99	3140820	BY-Lens o-ring	1
	BY328-0004 (not shown)	AL246		BY-Screw kit for BY328-3663-C (3 pcs)	3

\*PolyTetraFluoroEthylene is a fluorocarbon-based polymer and is commonly abbreviated PTFE. The Teflon® brand of PTFE is manufactured only by DuPont and is not sold by Hypertherm. Hypertherm purchases other brands of PTFE from various high quality manufacturers.

Nozzle bodies and associated parts on this page can be used with nozzles on pages 20-23.



## Bystronic<sup>®</sup>



#### Consumables

	Centricut part number	Esse A part number	Reference number	Description	Pkg qty
1	BY328-0642	AL125	4-01642	BY-Insulating disc ceramic	1
	BY328-1642	AL231	4-01642	BY-Insulating disc ceramic	1
2	BY328-8701	AL172	2-08701	BY-Nozzle body	1
3	BY359-2930	AL423	10032930	BY-Nozzle body	1
	BY328-0959	AL124	4-01959	BY-Cone ceramic	1
4	BY328-1959	AL230	4-01959	BY-Cone ceramic	1
5	BY359-2838	AL425	10032838	BY-Insulating ring ceramic	1
6	BY328-1071	AL174	3-11071	BY-Fastening nut	1
7	BY359-2839	AL424	10032839	BY-Fastening nut	1
8	BY328-9010	AL126	4-09010	BY-Ring ceramic	1
	BY328-8700	AL173	2-08700	BY-shield	1
9	BY328-0005	AL173X	2-08700	BY-signboard	1

Nozzle bodies and associated parts on this page can be used with nozzles on pages 20-23.



Replacement parts suitable for: Bystronic®



#### Consumables

	Centricut part number	Esse A part number	Reference number	Description	Pkg qty
1	BY359-3113	AL215	3-13113	BY-Insulating ring, small	1
2	BY359-0837	AL214	2-10837	BY-Nozzle body	1
3	BY359-3422	AL216	3-13422	BY-Insulating ring w/holes, large	1
4	BY359-3110	AL258	3-13110	BY-Shield, copper	1

Nozzle bodies and associated parts on this page can be used with nozzles on pages 20-23.



## Bystronic<sup>®</sup>





#### Consumables

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	Centricut part number	Esse A part number	Reference number	Description	Pkg qty
1	BY359-6035	AL222	3-06035	BY-Shield, copper only	1
	BY359-0001	AL245		BY-Screw kit (3 pcs)	3
2	BY328-328-1	AL120	3-06035-T	BY-Disc, PTFE*	1
3	BY328-4976	AL209	4-04976	BY-Knurled screw	1
4	BY328-6511	AL300	2-06511	BY-Brush w/screws	1
5	BY328-3884		333884	BY-Screws, plastic (2 pcs)	2
	Filters - not shown				
	BY328-0020	7004621	D020	BY-Air filter (Deltec)	1
	BY328-4753	7001341	71064753	BY-Vacuum pump filter	1
	BY328-0145	8820145	8820145	BY-Water filter	1
	BY328-0154	/328-0154 8820154 8820154 BY-Water filter 140M/C		BY-Water filter 140M/C	1
	BY328-9417	9417 7509417 A37100MF0 BY-Filter, 37x106		BY-Filter, 37x106	1
	BY328-9412	7509412		BY-Air filter (active coal)	1
	BY328-9412L	7509412 - LONG	7509412 - long	BY-Air filter (active coal) long, 190 mm	1
	BY328-2456	502456	502456	BY-Vacuum pump filter 4000W	1

\*PolyTetraFluoroEthylene is a fluorocarbon-based polymer and is commonly abbreviated PTFE. The Teflon® brand of PTFE is manufactured only by DuPont and is not sold by Hypertherm. Hypertherm purchases other brands of PTFE from various high quality manufacturers.



Replacement parts suitable for: Bystronic®

#### Optics

Centricut	Reference			Focal	Edae
part number	number	Туре	Diameter	length	thickness
Lenses					
BY314-0185	4-00185	MEN	1.5"	3.75"	.236"
BY314-0736	4-10736	MEN	1.5"	3.75"	.354"
BY314-0186	4-00186	MEN	1.5"	5.00"	.236"
BY314-5094	4-05094	MEN	1.5"	5.00"	.354"
BY314-1644	120216, 621644	MEN	1.5"	5.00"	.354"
BY314-7475		MEN	1.5"	5.00"	.354"
BY314-0187	4-00187	MEN	1.5"	7.50"	.236"
BY314-5095	4-05095	MEN	1.5"	7.50"	.354"
BY314-8637	698637	MEN	1.5"	7.50"	.354"
Ultra low absorption lenses					
BY314-0186MP5	4-00186	MEN	1.5"	5.00"	.236"
BY314-5094MP5	4-05094	MEN	1.5"	5.00"	.354"
BY314-0187MP5	4-00187	MEN	1.5"	7.50"	.236"
BY314-5095MP5	4-05095	MEN	1.5"	7.50"	.354"
BY314-8294MP5	996707	MEN	1.5"	9.00"	.354"
BY314-7014MP5	460386	MEN	1.5"	10.00"	.354"

Centricut part number	Reference number	Туре	Diameter	Edge thickness
Windows				
BY314-5746	10-02-01-5511,10045746,968752	FS	36.00 mm	5.00 mm

#### **Optics** care

Centricut	Reference		Pkg
part number	number	Description	qty
TR300-6452		Lens cleaning Tiffen paper (50 pcs)	1
TR300-1115		Lens cleaning pre-cut cotton (100 pcs)	1
TR300-1010	AL1010	Dropper, lens cleaning fluid	1
TR300-1112		Optical cleaning fluid	1
TR300-0699	70675699 REVA	Lens cleaning swabs (25 pcs)	1
TR300-7991	27991	Polyester wipes 4" x 4" (100 pcs)	1
TR301-0282		Injector	1
TR300-LSA		Lens stress analyzer	1
TR300-255	AL255	Magnifying loop	1
TR300-271	AL271	Base, mirror maintenance	1
TR300-7388	787388	Mirror polish .1UM 250ML	1



## Sensor cones



## Centricut sensor cones provide substantial cost savings without sacrificing performance or quality

- Available for Amada, Mazak, Mitsubishi and Precitec
- Delivers the same OEM performance at a lower cost
- Unmatched performance and reliability
- Engineered and manufactured to Hypertherm's precise quality standards
- Backed by our one-year warranty and 100% satisfaction guarantee

Centricut		Reference	
part number	OEM	number	Description
AM343-0091	Amada	71360091	AM-Sensor cone, HS95 mini
AM343-1621	Amada	71341621	AM-Sensor cone, HS95
AM343-9107	Amada	ECO cone	AM-Sensor cone, ECO
AM343-1690	Amada	71341690	AM-Sensor cone, HS98
AM343-L3015C	Amada	71374509	AM-Sensor cone, LC3015
PT347-3323	Mazak	HNP	PT-Sensor cone, HNP
MZ335-HNPS	Mazak	HNPS	MZ-Sensor cone, HNP short version
PT347-0007	Mazak	56743300500	PT-Sensor cone, HNZ (Mazak)
PT347-0011	Mitsubishi	P0354-110-00002	PT-Sensor cone, HNZ (Mitsubishi)
MB334-W429A	Mitsubishi	P0461-270-00001	MB-Sensor cone, W429A
PT347-0238	Precitec	BQ930D238G01	PT-Sensor cone, HNZ SMA
PT347-8001	Precitec	P0361-203-00001	PT-Sensor cone, 2.5/J
PT347-0522	Precitec	P0599-520-00002	PT-Sensor cone, LRC
PT347-1145	Precitec	P0380-140-0002, P0380-130-00001, 281145	PT-Sensor cone. DZ

\*Sensor cone repair service is available for most sensor cones in North America and select international regions. For more information contact Ctlaser@Hypertherm.com.

## Armored sensor cables

## Centricut armored sensor cables outlast standard OEM cables

- Available for all major brands
- Robust design with extreme temperature rating (900–1200°)
- Longer life reduces downtime and production loss
- Spatter resistant stainless steel armoring
- Reinforced collars and high-quality connector





#### Armored sensor cables

Centricut		Reference	
part number	OEM	number	Description
AM308-8965	Amada	71398965	AM-Sensor cable, 305 mm (12")
AM308-8965A	Amada	71398965	AM-Sensor cable, 305 mm (12") premium, armored
AM313-1901	Amada		AM-Sensor cable, 305 mm (12")
AM313-1901A	Amada	71341630	AM-Sensor cable HS-5, 305 mm (12") premium, armored
AM313-8292	Amada	71398292	AM-Sensor cable dual shield, 7 meters
AM313-9851A	Amada	71369851	AM-Sensor cable, 230 mm (8") premium
CN306-0654A	Cincinnati	909654, 922686	CN-Sensor cable, 114 mm (4.5") armored
CN306-0951A	Cincinnati	842951	CN-Sensor cable, 140 mm (5.5") armored
CN306-2951	Cincinnati	842951, PLTTW0015	CN-Sensor cable, 140 mm (5.5")
CN306-9654	Cincinnati	909654, 922686, PLTTW0002	CN-Sensor cable, 114 mm (4.5") armored
MZ335-0111A	Mazak	4674330111	MZ-Sensor cable, 280 mm (11") armored
MZ335-0181A	Mazak	46743300181	MZ-Sensor cable, 317.5 mm (12.5") armored
MZ335-1330A	Mazak	46683301330	MZ-Sensor cable, 305 mm (12") armored
MZ335-1980A	Mazak	46683301980	MZ-Sensor cable, 280 mm (11") armored
MZ335-5320	Mazak	6143355320	MZ-Sensor cable, 70 mm (2.8") armored
MZ335-630A	Mazak	00BSBA630MNC	MZ-Sensor cable, 630 mm (25") armored
MZ335-8290	Mazak	46143308290	MZ-Sensor cable, 75 mm (3")
NT426-1682	NTC	4R029911-001, J482D	NT-Sensor cable, 216 mm (8.5")
NT426-4991	NTC	3-0104991	NT-Sensor cable 0-OBNC/MCX, 482 mm (19")
NT426-7492	NTC	3-0117492	NT-Sensor cable 90BNC/90BNC, 482 mm (19")
NT426-8677	NTC	4R028677-001	NT-Sensor cable, 508 mm (20") armored
PR361-3150	Prima	820.63.150	PR-Sensor cable, 150 mm (6")
PT347-0014	Precitec	P36015000300, KE 300 gw Z MM	PT-Sensor cable OEM
PT347-0015A	Precitec	00B-15	PT-Sensor cable, 380 mm (15")
PT347-0040	Precitec	00BB-A-17i, BEC004-000.4	PT-Sensor cable, 431 mm (17") armored
PT347-0101A	Precitec	P0360-100-00500	PT-Sensor cable, 500 mm (20") armored
PT347-0181	Precitec	46743300181	PT-Sensor cable
PT347-0250	Precitec	342475	PT-Sensor cable, 250 mm (10") armored
PT347-0300A	Precitec	P0492-014-00300	PT-Sensor cable KE, 300 mm (12") armored
PT347-0450	Precitec	P0497-002-00450	PT-Sensor cable, 450 mm (17.7")
PT347-KS13	Precitec/Gunkyo	00BMTKA-A-HS500mm	PT-Sensor cable, 390 mm (15.5") armored
PT347-06000EM	Precitec	P0360-210-00600	PT-Sensor cable, 600 ZWW 0EM
PT347-1250	Precitec	D5001-040-00250	PT-Sensor cable, 250 mm (10") armored
PT348-0390	Precitec		PT-Sensor cable, 390 mm (15.5")
TR301-0930	Trumpf	280930	TR-Sensor cable, 152 mm (6") armored
TR301-1086	Trumpf	351086, S0492-001-00000	TR-Sensor cable
TR301-7833	Trumpf	227833	TR-Sensor cable, 432 mm (17")
TR301-9983	Trumpf	359983, 342474	TR-Sensor cable, 190 mm (7.5") armored

## Lens cleaning tips



#### Centricut supplies suitable for all OEM CO<sub>2</sub> and fiber laser lenses

- Lens maintenance base is designed to secure a wide range of optics sizes for the cleaning process
- Centricut optical cleaning fluid is a safe, economical alternative to traditional high-purity and reagent-grade solvents
- Cleaning materials suited for all lens cleaning needs; lens paper, polyester swabs and polyester wipes

#### Lens paper

Recommended for the routine maintenance cleaning of flat lenses.

#### **Polyester swabs**

Recommended for cleaning curved lenses and where a more aggressive cleaning is required (interchangeable with polyester wipes).

#### **Polyester wipes**

Recommended for cleaning CO<sub>2</sub> and fiber lenses and windows (interchangeable with polyester swabs and lens paper).

Product description	Part number	Quantity per order
Optical cleaning fluid (3 oz.)	TR300-1112	1
Lens cleaning swab	TR300-0699	25
Lens cleaning paper, Tiffen	TR300-6452	50
Polyester wipes 4" x 4"	TR300-7991	100
Base, lens maintenance	TR300-271	1

#### Lens paper

Recommended for the routine maintenance cleaning of flat lenses.

#### You will need:

- Lens maintenance base (lens holder)
- Optical cleaning fluid



#### Air bulb

- Lint-free lens paper
- Latex or rubber gloves

#### To get started

Using rubber gloves, place the lens in the lens holder and remove all loose contaminants with an air bulb. When contaminants are no longer visible, begin the cleaning process.

#### Step 1

Place lens paper over the optic, covering it completely.



#### Step 2

Apply a couple drops of lens cleaning fluid to the lens paper (far side of the lens).



#### Step 3

Slowly pull the lens paper across the lens so the cleaning fluid comes in contact with the entire lens surface. Finish pulling the paper across so all of the fluid has dried from the lens.

#### Step 4

Inspect the surface of the lens for dust and cleaning residue using a flashlight. Examine the lens from different angles. Repeat the process on the other side of the lens.

#### Final step:

Place the cleaned lens in the machine quickly to avoid contamination from airborne particles. If spots, pits, or scratches are still noticeable, the lens may need

to be replaced.

#### **Polyester swabs**

Recommended for cleaning curved lenses and where more aggressive cleaning is required. Interchangeable with polyester wipes.

#### You will need:

- Lens maintenance base (lens holder)
- Optical cleaning fluid
- Air bulb
- Polyester swabs
- Latex or rubber gloves

# -

#### To get started

Using rubber gloves, place the lens in the lens holder and remove all loose contaminants with an air bulb. When contaminants are no longer visible, begin the cleaning process.

#### Step 1

Place a few drops of the optical cleaning fluid onto the swab.

## Polyester wipes

Recommended for cleaning  $CO_2$  and fiber lenses and windows. Interchangeable with polyester swabs and lens paper.

#### You will need:

- Lens maintenance base (lens holder)
- Optical cleaning fluid
- Air bulbPolyester wipes
- Latex or rubber gloves



#### To get started Using rubb

Using rubber gloves, place the lens in the lens holder and remove all loose contaminants with an air bulb. When contaminants are no longer visible, begin the cleaning process.



#### Step 1

Place a few drops of the optical cleaning fluid onto the polyester wipe



#### Step 2

Move the larger dirt particles and then finer contaminants to the edge of the lens using the swab. Do not rest the swab on the lens or on the work table. Do not reuse swabs.



#### Step 3

Inspect the surface of the lens for dust and cleaning residue using a flashlight. Examine the lens from different angles. Repeat the process on the other side of the lens.

#### Final step:

Place the cleaned lens in the machine quickly to avoid contamination from airborne particles. If spots, pits, or scratches are still noticeable, the lens may need to be replaced.



#### Step 2

Place the wipe with the wet side down on the lens and slide it across the lens, applying light pressure to the top of the wipe. Avoid contamination to the wipe and do not reuse wipes.



#### Step 3

Inspect the surface of the lens for dust and cleaning residue using a flashlight. Examine the lens from different angles. Repeat the process on the other side of the lens.

#### Final step:

Place the cleaned lens in the machine quickly to avoid contamination from airborne particles. If spots, pits, or scratches are still noticeable, the lens may need to be replaced.

## Steps to help optimize cut quality.

Striation marks, angularity and dross tell the story.

Optimizing CO<sub>2</sub> and fiber lasers to achieve maximum cut quality is a very important step in the overall cutting process. The critical points that produce good cuts are the width of the kerf (the material that is lost during the cut), oxidation and roughness of the cut surface, the geometry of the cut parts and the allowable tolerances. Some factors to be considered are the cut speed or 'feed rate', beam focus, gas pressure, standoff and nozzle size/ type.

#### Factory cut chart settings

The following samples show 12 mm, 6 mm and 3.2 mm (1/2", 1/4" and10 ga.) mild steel, cut with  $O_2$  on a 2 kW fiber laser with one variable changed to show how cut quality is affected. The adjustments will be similar for all CO<sub>2</sub> and fiber laser, cutting mild steel with O<sub>2</sub>.

#### Is the kerf too narrow?

When the kerf is too narrow the cut will have a very smooth edge on the top, a lack of oxidation on the bottom and/or heavy dross.

#### **Probable causes:**

- Focus is too low
- Feed rate is too fast
- Gas pressure is too low
- Nozzle size is too small
- Standoff is too low

#### Is the kerf too wide?

When the kerf is too wide the cut will have a rougher edge, more self burning in the corners of the part, more angularity on the cut edge and occasionally, dross.

#### **Probable causes:**

- Focus is too high
- Feed rate is too slow
- Gas pressure is too high
- Nozzle size is too big
- Standoff is too high
- Incorrect nozzle type

#### Follow these steps to optimize cut quality:

- 1. Use the closest known settings for the material being cut.
- 2. Use a test part that has both interior and exterior features.
- 3. Verify that the lens and/or window is clean and in good condition.
- 4. Verify that the nozzle is centered properly and is in good condition.
- 5. Adjust the focus up and down until the cut quality starts to get bad and then set to the middle of that range.
- 6. Adjust the gas pressure up and down until the cut starts to get bad and then set to the middle of that range.
- 7. Adjust the federate up by 5% increments. When the cut starts to get bad, set the feed rate 10% slower.

#### Strike a balance between heat levels and gas flow

Cutting mild steel with a laser is a balance of how much material is heated by the laser beam and how much assist gas flows through the cut.

- Heating up too small of an area, or not having enough assist gas flow through the cut will result with the kerf (width of the cut) being too narrow.
- Heating up too large of an area or having too much assist gas flow through the cut will result in the kerf being too wide.

# 3.2 mm (10 ga.) mild steel cut resulting in too narrow kerf

# 3.2 mm (10 ga.) mild steel cut resulting in too wide kerf

Factory cut chart settings





#### Factory cut chart settings

#### Focus is too low

The kerf is too narrow and doesn't allow enough  $O_2$  into the cut to remove all the molten material.

#### Feed rate is too fast

The cut striations are trailing the direction of cutting and there is not enough time to remove all the molten material.

#### Gas pressure is too low

There is not enough  $O_2$  to remove all the molten material.

#### Stand off is too low

The focus spot is in the wrong location, causing the rough edge.



















#### Focus is too high

The laser is melting more material than can be removed from the cut.

#### Feed rate is too slow

The cut surface is too rough and productivity is decreased.

#### Gas pressure is too high

Too much O<sub>2</sub> results in overheating of the cut and causes intermittent gouges.

#### Stand off is too high

The laser is melting more material than can be removed from the cut.

#### Nozzle size is too big

Too much O<sub>2</sub> results in overheating of the cut and causes intermittent gouges.

#### **Cut direction**

**Cut direction** 

\*Above samples have been cut with  $O_2$  on 2 kW fiber laser. Results will be similar for  $CO_2$  laser cutting mild steel with  $O_2$ .

# 6 mm (1/4") mild steel cut resulting in too narrow kerf

#### Factory cut chart settings

6 mm (1/4") mild steel cut resulting in too wide kerf

1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 | 1777 |

#### Factory cut chart settings

#### Focus is too low

The kerf is too narrow and doesn't allow enough  $O_2$  into the cut to remove all the molten material.

#### Feed rate is too fast

The cut striations are trailing the direction of cutting and there is not enough time to remove all the molten material.

#### Gas pressure is too low

There is not enough  $O_2$  to remove all the molten material.

#### Stand off is too low

The focus spot is in the wrong location, causing the rough edge.

#### Nozzle size is too small

There is not enough O<sub>2</sub> to cut uniformly















#### Focus is too high

The wider focus spot is letting too much  $O_2$  into the cut and burning the material.

#### Feed rate is too slow

The cut surface is too rough and productivity is decreased.

#### Gas pressure is too high

Too much  $O_2$  is entering the cut, causing a rougher edge and inconsistent cutting.

#### Stand off is too high

Too much  $O_2$  is entering the cut, causing a rougher edge and inconsistent cutting.

#### Nozzle size is too big

Too much  $O_2$  results in overheating of the cut and causes intermittent gouges.

#### Nozzle type is incorrect

The shape of the gas flow is incorrect, causing a rougher edge.

#### **Cut direction**

#### **Cut direction**

\*Above samples have been cut with  $O_2$  on 2 kW fiber laser. Results will be similar for  $CO_2$  laser cutting mild steel with  $O_2$ .

## 12 mm (1/2") mild steel cut resulting in too narrow kerf

#### Factory cut chart settings



#### Focus is too low

The kerf is too narrow and doesn't allow enough  $O_2$  into the cut to remove all the molten material.





#### Factory cut chart settings

#### Stand off is too low

The kerf is too narrow to allow enough  $O_2$  into the cut. The oxidation is not covering the entire surface and cutting will be inconsistent.

#### Nozzle size is too small

There is not enough  $O_2$  to cut uniformly

#### Feed rate is too fast

The machine is moving too fast to allow enough  $O_2$  into the cut for consistent cutting.



The pressure is too low to allow enough  $O_2$  into the cut. The oxidation is not covering the entire surface and cutting will be inconsistent.



#### **Cut direction**

#### **Cut direction**

\*Above samples have been cut with  $O_2$  on 2 kW fiber laser. Results will be similar for  $CO_2$  laser cutting mild steel with  $O_2$ .

## 12 mm (1/2") mild steel cut resulting in too wide kerf

#### Factory cut chart settings



#### Focus is too high

Too much  $O_2$  is entering the cut causing intermittent over burning.





#### Stand off is too high

Factory cut chart settings

Too much  $O_2$  is entering the cut resulting in intermittent over burning.

#### Feed rate is too slow

The machine is moving too slow resulting in the over burning of the bottom half of the cut. The slower feed rate also reduces productivity.

#### Gas pressure is too high

Too much  $O_2$  is entering the cut resulting in intermittent over burning.





#### Incorrect nozzle type

The gas flow shape is not correct resulting in inconsistent cutting.

#### **Cut direction**

#### **Cut direction**

\*Above samples have been cut with  $O_2$  on 2 kW fiber laser. Results will be similar for  $CO_2$  laser cutting mild steel with  $O_2$ .

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## Technical support and customer service

Our technical service team can answer questions about any laser cutting system. Whether it's a question about a part, a system or for guidance on how to optimize laser cutting performance, our experts can help.

- OEM trained technicians with over 40 years experience
- Free application support for all laser OEMs

MACH-20L

• We stand behind our products with industry-leading technical expertise

Contact a laser expert at ctlaser@hypertherm.com

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