



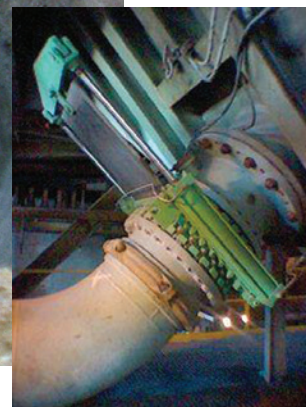
Solutions For
Gold Mining

Golden Solutions

Tyco Flow Control can deliver a package of proven isolation, control and automation solutions for the production of Gold. Tyco's product portfolio offers flow control solutions for many applications including mills, cyclones, smelters, autoclaves and heap leach pads, we bring you trusted brands like Clarkson, Keystone, L&M Valve, NeoTecha, Richards, KTM, Vanessa, Morin, Biffi, Anderson Greenwood, Crosby and Westlock Controls to keep your operations running.

We have developed an application matrix that presents an overview of our products use within Gold production. Our products are installed in the world's largest facilities. Our wide portfolio of product enables us to solve our customer's many applications requirements whether that is with a standard product currently in production or a custom designed product specifically for their application.

Tyco Flow Control manufactures a complete range of manual, electric, pneumatic and hydraulic actuation packages for our range of valves, which meet the changing requirements of health and safety. Whatever the application, you can rely on Tyco Flow Control to have the solution.



... global reach, local presence



1. Reno, Nevada, USA
Clarkson, L&M Valve,
Roalve Products



2. Stafford, Texas, USA
Anderson Greenwood, Crosby,
Varec and Yarway Products



3. Birmingham, Alabama, USA
Morin Products



4. Newark, New Jersey, USA
Westlock Controls Products



5. Sorocaba, Brazil
Keystone Products



6. Fiorenzuola d'Arda, Italy
Biffi Products



7. Ham, France
Sapag Products



8. Japan
KTM Products



9. Nowra NSW, Australia
Keystone Products

Product Application Matrix

Dewatering services
Process/Raw
Water
Water injection

The Application Matrix helps users identify specific applications for Tyco product within conventional processing in the Gold industry.

There is seldom a single solution for a given application, due to pipe layout, available space and the ever increasing use of automation on-site.

Technology, economies and safety within Gold production help drive innovation and improved outcomes.

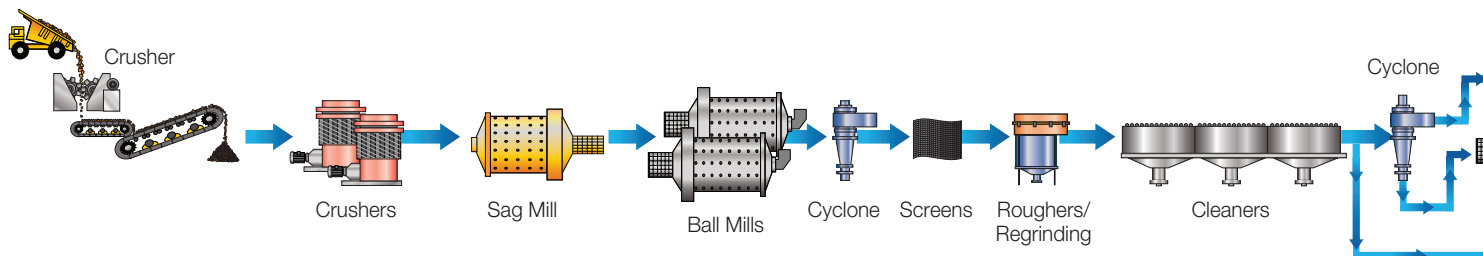
Our global Gold product portfolio demonstrates this with our range of site tested and proven products.

Our Tyco Mining team is always willing to work with you, combining our extensive mining

experience and flow control know-how to help you solve the toughest process applications you face.

Brand	Design				
Butterfly					
Keystone	F990		•		•
Keystone	K-LOK		•	•	
Keystone	Hi-LOK		•	•	
Keystone	611		•	•	•
Keystone	AR1, AR2			•	•
NeoTecha					•
RMI					
Winn			•	•	
Sapag					
Vanessa					•
Ball					
Hindle			•		•
KTM			•		•
Neotecha			•		•
FCT			•		•
Richard			•		•
Check Valves					
Gulf	Dual Plate Wafer		•	•	•
Prince	Wafer Swing		•	•	•
Hancock	Swing Check			•	
Actuation					
Biffi			•	•	
Keystone	79U		•	•	•
Morin			•	•	•
Westlock			•	•	•
Tyco Hydraulics			•	•	

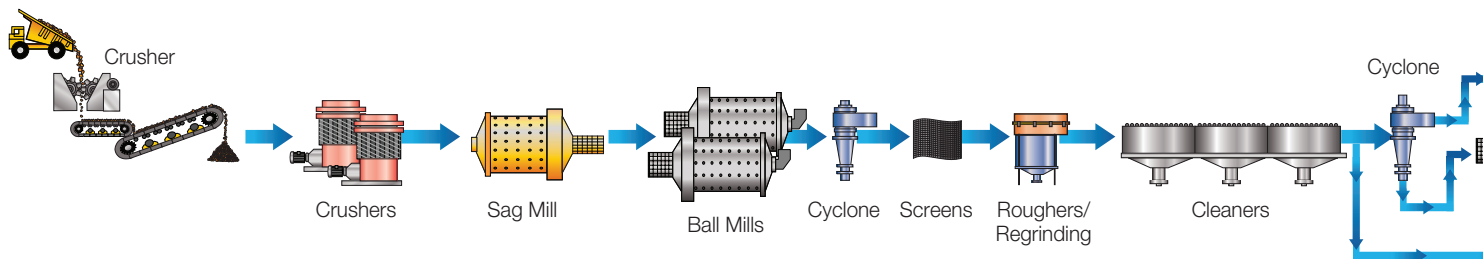
Raw Material Transportaion



Product Application Matrix

		Dewatering services	Process/Raw Water	Water injection
Brand	Design			
Pinch				
Clarkson	C-Valve			
Keystone				
Knife Gate and Slurry Valves				
Keystone	F952		•	•
Keystone	955		•	•
Rovalve	S20		•	•
Rovalve	S17		•	•
Clarkson	KGD		•	•
Clarkson	KGA		•	•
Clarkson	KGF-HP			•
Clarkson	KGF			•
L&M	M145/345/202		•	•
Line Blind				
Clarkson	KLB, RGA			
Control Valves				
Clarkson	C-Valve			
KTM	Single V, Dual V			
Keystone	F634,635,637,638			
Keystone	F955-V			

Raw Material Transportaion



Rotary Valves

Valves for the control and isolation of slurries throughout the copper process. Our installed base and experience over many years of operation and product improvement ensures the right valve for every application.



Wafer Style Resilient Seated Butterfly Valve

Brand:
Keystone

Size, inches [mm]:
1 to 24 [40 to 600]

Pressure, psi [kPa]:
Up to 235 [1600]

Temperature, °F [°C]:
Up to 300 [150]

Flanges:
ASME 125, 150

Features:

- Wafer style body.
- Bi-directional, bubble tight resilient seated valve.
- Top and bottom inboard bearings.
- Super duplex trim.
- One piece thin stainless steel disc.
- Compact, light weight wafer style body bi-directional bubble tight shut-off.



Lugged Style Resilient Seated Butterfly Valve

Brand:
Keystone

Size, inches [mm]:
1 to 24 [40 to 600]

Pressure, psi [kPa]:
Up to 235 [1600]

Temperature, °F [°C]:
Up to 300 [150]

Flanges:
ASME 125, 150

Features:

- Lugged style bi-directional, bubble tight resilient seated valve.
- Top and bottom inboard bearings.
- Super duplex trim.
- One piece thin stainless steel disc.
- Compact, light weight lugged style body bi-directional bubble tight shut-off.



Double Flanged Butterfly Valve

Brand:
Keystone

Size, inches [mm]:
24 to 68 [600 to 1200]

Pressure, psi [kPa]:
150 [1000]

Temperature, °F [°C]:
Up to 200 [120]

Flanges:
ASME 150, AS 2129

Features:

- Double flanged body.
- Bi-directional, bubble tight resilient seated valve.
- Top and bottom inboard bearings.
- One piece through shaft.



PTFE Lined Butterfly Valve

Brand/Model:
NeoTeche, PTFE/PFA

Size, inches [mm]:
1½ to 36 [40 to 900]

Pressure, psi [kPa]:
Up to 150 [1000]

Temperature, °F [°C]:
Up to 400 [200]

Flanges:
ASME 150, AS 2129

Features:

- PTFE lined internals.
- Utilizes mechanical stem seal.
- Wide PTFE sealing face.
- Suitable for shut-off or control of highly corrosive media.



High Performance Butterfly Valve

Brand/Model:
Keystone, K-LOK

Size, inches [mm]:
2 to 36 [50 to 900]

Pressure, psi [kPa]:
740 [5100]

Temperature, °F [°C]:
Up to 1000 [535]

Flanges:
ASME 150, 300, AS 2129

Features:

- Double offset disc-stem for reduced opening/closing torque.
- Range of interchange seat options.
- Cast steel or SS body.
- R.T.F.E. seats.
- U.H.M.W.P.E. seats.



**High Performance
in Exotic Materials
Butterfly Valve**

Brand/Model:
Keystone, K-LOK

Size, inches [mm]:
2 to 36 [50 to 900]

Pressure, psi [kPa]:
740 [5100]

Temperature, °F [°C]:
Up to 995 [535]

Flanges:
ASME 150, 300, AS 2129

Features:

- Alloy 2205 Duplex R.T.F.E. Seat
- Alloy 20 R.T.F.E. Seat
- Hastelloy® C276 R.T.F.E. seat
- SMO 254 R.T.F.E. seat



**Light/Medium Duty
Control Valve**

Brand/Model:
Keystone F634

Size, inches [mm]:
1 to 24 [40 to 600]

Pressure, psi (kPa):
285 [1960]

Temperature °F [°C]:
445 [230]

Flanges:
ASME B16.5, Class 150

Features:

- Wafer style body
- Robust Construction
- Bi-direction isolation
- Adjustable gland packing
- Fully reparable asset with replaceable internals
- Available in various coating options to improve performance



**Extended Body
Heavy Duty Control
Valve**

Brand/Model:
Keystone, F638

Size, inches [mm]:
3 to 24 [80 to 600]

Pressure, psi [kPa]:
1480 [10,210]

Temperature, °F [°C]:
Up to 450 [230]

Flanges:
ASME 150, 300, 600

Features:

- Series 2 and Series E extended body design protects downstream pipeline.
- Replaceable liner.
- Choice of trim options.
- Modular actuator mounting.



**Rotary Process
Valve**

Brand/Model:
Vanessa, Series 30,000

Size, inches [mm]:
3 to 142 [80 to 3600]

Pressure, psi [kPa]:
2250 [15,513]

Temperature, °F [°C]:
Up to 1500 [815]

Flanges:
ASME 150, 300, 600, 900

Features:

- Unique triple offset metal seated valve.
- Zero leakage.
- One piece cast body.
- Stellite seat standard.
- Full range of actuators available.



V-Port Control Valve

Brand/Model:
KTM, V-Ball

Size, inches [mm]:
1 to 8 [25 to 200]

Pressure, psi [kPa]:
740 [1965]

Temperature, °F [°C]:
Up to 500 [260]

Flanges:
ASME 150, 300

Features:

- Full and reduced bore designs.
- V-Notch design allows equal percentage characteristics for precise control.
- One piece body design.

Knife Gate Valves

Heavy duty knife gate isolation valves for the heaviest copper slurries. Actuated solutions for all plant conditions make us your first choice.



Uni-directional Knife Gate Valve

Brand/Model:
Keystone, F951, F952

Size, inches [mm]:
2 to 24 [50 to 600]

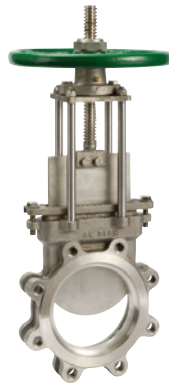
Pressure, psi [kPa]:
150 [1000]

Temperature, °F [°C]:
Up to 446 [230]

Flanges:
ASME, AS 2129

Features:

- Wafer and lugged body.
- Self aligning gland box.
- One piece cast body and chest.
- Stainless steel valve body and trim.



Uni-directional Knife Gate Valve

Brand/Model:
Rovalve, S20

Size, inches [mm]:
2 to 36 [50 to 900]

Pressure, psi [kPa]:
150 [1000]

Temperature, °F [°C]:
-20 to 883 [-29 to 455]

Flanges:
ASME, AS 2129

Features:

- Cast stainless steel body.
- Shut-off to MSS SP-81.



Bi-directional Edge Seal Knife Gate Valve

Brand/Model:
Rovalve, PCS17

Size, inches [mm]:
2 to 24 [50 to 600]

Pressure, psi [kPa]:
150 [1000]

Temperature, °F [°C]:
-20 to 400 [-29 to 205]

Flanges:
ASME, DIN, PN

Features:

- Field replaceable one piece seat.
- Four post yoke.
- Bi-directional shut-off.
- Integral packing support bar with metal substrate.



Heavy Duty Slurry Isolation Valve

Brand/Model:
Clarkson, KGA

Size, inches [mm]:
3 to 60 [80 to 1525]

Pressure, psi [kPa]:
100 [690]

Temperature, °F [°C]:
Up to 300 [150]

Flanges:
ASME, AS 2129

Features:

- Bi-directional shut-off.
- Heavy duty slurry valve.
- Replaceable full port elastomer sleeves.
- No metal parts in the flow path (open position).



Heavy Duty Slurry Isolation Valve

Brand/Model:
Clarkson, KGD

Size, inches [mm]:
2 to 24 [50 to 600]

Pressure, psi [kPa]:
200 [1380]

Temperature, °F [°C]:
Up to 300 [150]

Flanges:
ASME, AS 2129, PN

Features:

- Bi-directional shut-off.
- Wafer style body.
- Replaceable full port elastomer sleeves.
- No metal parts in the flow path.



High Pressure Slurry Isolation Valve

Brand/Model:
Clarkson, KGF (HP)

Size, inches [mm]:
3 to 36 [80 to 900]

Pressure, psi [kPa]:
740 [5110]

Temperature, °F [°C]:
Up to 300 [150]

Flanges:
ASME, AS 2129

- Features:
- Bi-directional shut-off.
 - Heavy duty slurry valve.
 - Replaceable full port elastomer sleeves.
 - No metal parts in the flow path open position.



Polymer Lined Knife Gate Valve

Brand/Model:
L&M Valve, M345 (HP)

Size, inches [mm]:
2 to 60 [50 to 1525]

Pressure, psi [kPa]:
1200 [8270]

Temperature, °F [°C]:
-20 to 350 [-29 to 180]

Flanges:
ASME, AS2129

- Features:
- Three piece replaceable polymer liner.
 - Bi-directional flow.
 - Full port design.



Pinch Valve

Brand/Model:
Keystone, F639

Size, inches [mm]:
1 to 40 [25 to 1000]

Pressure, psi [kPa]:
150 [1000]

Temperature, °F [°C]:
450 [230]

Flanges:
ASME 150, AS2129

- Features:
- Rugged design slurry control valve.
 - Full bore design.
 - Bi-directional shut-off.
 - A range of sleeve materials available.



Slurry Modulating Control Valve

Brand/Model:
Clarkson, "C" Valve

Size, inches [mm]:
1 to 10 [25 to 250]

Pressure, psi [kPa]:
100 [150]

Temperature, °F [°C]:
Up to 300 [150]

Flanges:
ASME, AS 2129

- Features:
- Designed specifically for slurry throttling.
 - No metal parts in flow path.
 - Abrasive resistant elastomer sleeve.



Prince Wafer Swing Check Valve

Brand/Model:
Clarkson, "C" Valve

Size, inches [mm]:
2 to 36 [50 to 900]

Pressure, psi [kPa]:
150 to 740 [1034 to 5102]

Temperature, °F [°C]:
Up to 1000 [538]

Flanges:
ASME 125-300

- Features:
- Wafer design reduces unnecessary weight.
 - Available in metal and resilient seats.
 - External spring available to remove spring from flow path.

Actuators, Controls & Process Automation

We offer everything from simple on/off isolation, to modulating process control and extend through to complete networked solutions using any of the network protocols.



Pneumatic Actuators

Brands:
Keystone, Morin, Biffi

Type:
Double acting
Spring return

Torque, lbf-ft [Nm]:
Up to 221,250 [299,976]

Temperature, °F [°C]:
Up to 200 [90]

Pressure, psi [kPa]:
Up to 150 [1050]



Electric Actuators

Brands:
Keystone, Biffi

Type:
1/4 turn
Multi turn

Torque, lbf-ft [Nm]:
Up to 1593 [2160]

Temperature, °F [°C]:
-40 to 150 [-40 to 60]

Voltage:
Single and three phase



Hydraulic Actuators

Brands:
Keystone, Morin, Tyco

Type:
Linear
1/4 turn

Torque, lbf-ft [Nm]:
Up to 20,000 [27,116]

Temperature, °F [°C]:
-20 to 212 [-30 to 100]

Pressure, psi [kPa]:
Up to 1500 [10,345]



Positioners

Brands:
Keystone, Westlock Controls

Type:
Analogue
Programmable

Input Current:
4-20 mA

Temperature, °F [°C]:
-40 to 185 [-40 to 85]

Pressure, psi [kPa]:
Up to 120 [827]



	H1	HSE	DP	PA	SDS	AS-i® Interface
Typical Applications:	Process industry, smart instrumentation, factory automation	Process industry, factory automation	Process industry, factory automation	Process industry, smart instrumentation	Process industry, factory automation	Process industry, factory automation
Data Rates (bits/sec):	31.25k	100M	9.6K-12M	31.25k	125/250/500K	167k
Communication technique:	Single master/multi master	Ethernet	Master/slave peer to peer	Gateway	Producer/consumer peer to peer	Master/slave
Media access algorithm:	Token passing	Token passing	Token passing	Token passing	CSMA/CD/NDA	Cyclic polling
Supported media:	Optical fibre, radio propagation (planned), twisted pair	Optical fibre, radio propagation (planned), twisted pair	Optical fibre, twisted pair	Twisted pair	Optical fibre, twisted pair	Pair
Maximum number of nodes:	32 per segment	-	127 per network	32 per segment	64 per network	62 per network
Deterministic:	Yes	Yes	Yes	Yes	Yes	Yes
Intrinsic safety:	Yes	No	No	Yes	No	No
Bus powered:	Yes	No	No	Yes	No	Yes
ASIC available:	Planned	Planned	Yes	Yes	Yes	Yes
Physical-layer standard:	IEC 61158-2 IEC 61784	IEC 61158	IEC 61158 IEC 61784	IEC 61158-2 IEC 61784	IEC 62026-3	IEC 62026-2
Applicable standards:	IEC 1158 ISA S50	IEC 1158 ISA S50	EN 50170 (part 2) DIN 19245	DIN 19245	ISO 11898	IEC 947-5-2D, EN 60947, DIN VDE 0660/208

Notes:

H1 and H2 are Foundation Fieldbus terms that the IEC does not use.

Profibus-DP also has an extended command set called DPV1, described in extensions to EN 50170, Version 1.0, November 1996.

DeviceNet and SDS are application-layer utilities that use CAN for the physical layer.

CSMA/CD: Carrier sense multiple access/collision detection; NDA: nondestructive bit wise arbitration.

Service Solutions

Tyco Flow Control has a dedicated team of flow control equipment repair specialists. We can offer you an unrivaled network of strategically located service centers across the Americas to maintain all types and brands of process equipment.



Valve and Actuator Repairs

Remove, overhaul, install and re-commission.

Documentation – the entire repair process of each valve is documented and dispatched with a detailed report.



Control Valves

Support of all common interfaces (PROFIBUS, DeviceNet™ and AS-i®).

Loop check.

Calibration, reconditioning and testing.

Trouble shooting.



Instrumentation

Servicing and calibration devices such as pH, temperature, flow, conductivity, and pressure.

Most voltages/pressures.

Trouble shooting.



Safety Relief Valves

Repair and service all manufacturers' safety relief valves from steam, gas, air and liquid service.

Accredited testing facility.

Pilot operated – both soft seat and hard seat.

Direct spring – conventional or balanced.

Tank vacuum/pressure relief.

Safety selector valves.

Anderson Greenwood and Crosby repair and testing center.

Workshop or on-site testing, repairs and calibration.



ISO and NATA Pressure

Pressure test to most international API and ASME standards.



Pump Equipment

This includes the, supply and retro-fit of high efficiency impellers, upgrading of wet end materials.

Components and sealing devices.

Additional services include hard facing and metal spraying to increase resistance to erosion and corrosion.



Pneumatic / Hydraulic Equipment

The complete refurbishment and servicing of hydraulic pumps, motors and power packs, along with linear actuators including seals, piston rods and re-chroming.



Field Services

Installation, commissioning, service, repair and on-going maintenance.

Repacking.

Calibration.

In-situ safety relief valve.

Testing ASME I.

In-situ valve lapping.

Emissions monitoring.



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