TAMCO EBTRON

AIR-IQ AIR FLOW MEASUREMENT SOLUTION

Series AIR-IQ / GTC-PC

Technical Data Sheet
Analog and RS-485 Output - 'C' Density

Damper / AFMD Packaged Solution

AIR-IQ SMART-SOLUTION

You provide the opening size, damper series, mounting and access requirements for probes; we build your unit with optimum sensor density, ideal probe placement and appropriate sleeve style.

APPLICATIONS

- Engineered premium **TAMCO**® damper with maintenance-free bearings and **EBTRON**® precision airflow measurement system for accurate, reliable, outside air intake control.
- Floor return airflow tracking.
- AHU return & bypass flow measurement.

BENEFITS/FEATURES

- Satisfy **ASHRAE**® **62.1, 189.1, 90.1** and **IMC Chapter 4**
- Obtain **LEED**® points.
- Save energy, reduce maintenance cost and improve indoor air quality.
- **TAMCO** damper leakage ≤3 cfm/ft² at 1" w.g. (AMCA 511 Certified Performance-Series 1500; AMCA 500-D Class 1A low leakage performance).
- **TAMCO** damper model choices include non-insulated, Air-foil Control; Thermally Insulated/Isolated design, to reduce the potential for damper condensation or freeze-up; Marine/salt water environment operation (SW option).
- **EBTRON** Thermal Dispersion (TD) measurement technology ensures accurate, repeatable measurement from zero flow (still air) with factory calibrated performance to **NIST-traceable standards**.
- True average, multi-point, independent sensors calibrated at 16 points.
- LCD and push-button interface for field configuration and diagnostics.
- Output options for Analog + RS-485, RS-485 ARCNet, Ethernet or LonWorks.

AIR-IQ / GTC-PC OVERVIEW

The TAMCO/EBTRON AIR-IQ solution combines a premium airflow measuring station with a high quality air-foil damper/sleeve in a laboratory-tested, engineered assembly that takes the guesswork out of airflow measurement.

The TAMCO/EBTRON AIR-IQ / GTC-PC AFMD package combines EBTRON Gold Series GTC116-PC high-performance analog/RS-485 output airflow measurement technology with any of the reliable, high quality TAMCO dampers, providing unprecedented reliability in airflow control and measurement. Whether the application is intake, exhaust, severe cold, or salt spray, a TAMCO/EBTRON AIR-IQ engineered solution is available. The AIR-IQ is simply the most accurate, reliable, high quality damper/airflow control solution on the market, all in a fully tested and integrated package that is easy to specify and install.

The AIR-IQ features TAMCO's reliable extruded aluminum damper design and construction features that ensure outstanding airflow control and low leakage performance, with robust damper components designed for maintenance-free operation. TAMCO's unique slip-proof linkage components maintain blade alignment to factory specifications using innovative hexagon linkage and pivot design elements to ensure flat-on-flat press fits that eliminate play and wear. An innovative self-lubricating dual bearing system eliminates metal-to-metal and metal-to-plastic contact with no required bearing maintenance over the estimated service life of over 20 years. TAMCO damper design elements reduce turbulence and pressure losses associated with typical sheet metal, sleeved construction.

The AIR-IQ includes EBTRON's top-of-the-line, most accurate and versatile Gold Series GTC116-PC thermal dispersion airflow and temperature measurement device (ATMD). EBTRON's field proven thermal dispersion technology ensures accurate and repeatable airflow measurement from zero flow through the entire range of airflow rates and temperatures encountered in today's high-performance buildings. Stable bead-in-glass thermistor probes and a high-performance, rugged microprocessor-based transmitter ensure percent of reading accuracy and interface options for virtually all modern building automation systems (BAS) without additional transmitters or transducers. Up to 16 individual sensor nodes are factory-calibrated at sixteen airflow rates between 0 and 5,000 FPM to NIST traceable standards in EBTRON's state-of-the-art calibration facility. Individual sensor node accuracy is 2% of reading for airflow and ± 0.15°F, from -20°F to 160°F for temperature. An integral programmable feature permits setting airflow alarms for Hi limit, Low limit or Setpoint with hysteresis, or for setting a status alarm for the transmitter and sensor probes. The GTC116 industrial grade, integrated transmitter permits concurrent analog and RS-485 network operation, with selectable BACnet® MS/TP Master, Modbus RTU or JCI N2-Bus® interface and communication with virtually all modern building automation systems (BAS).

Over twenty-seven years of experience go into every reliable EBTRON airflow measuring device supplied in each AIR-IQ engineered solution. No periodic calibration or adjustment of the ATMD or damper is necessary when installed as recommended in normal HVAC applications.

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AIR-IQ / GTC-PC SPECIFICATIONS

TAMCO AIR-IQ Damper Typical Characteristics

Note: Series 1000 detail shown; For all other damper series refer to individual specifications available at www.tamcodampers.com)

Damper Frame: . . . . . .4" [101.6mm] deep, extruded aluminum 6063T5, minimum 0.080" [2.03mm] thickness.

Blades: . . . . . .Extruded aluminum 6063T5 profile.

Blade/Frame Seals: . . . . . .Precision, extruded EPDM blade seals; Rugged extruded silicone frame seals; All seals integrated within channels of aluminum extrusions.

Bearings: . . . . . .Maintenance-free Celcon inner bearing; 7/16" [11.11mm] hexagonal aluminum blade pin; polycarbonate outer frame bearing.

Linkage: . . . . . .Integral to frame, using aluminum and corrosion-resistant hardware with cup-point trunnion screws to eliminate free play and slip.

Leakage: . . . . . .Class 1A - less than 3cfm/ft^2 [15.2 l/s/m^2] against 1" [0.25 kPa] w.g. differential static pressure.

Blade Operation: . . . . . .Dampers available with parallel or opposed blade operation.

Max. Static Diff. Pressure: . .Maximum 2.5" w.g. absolute maximum static differential pressure. Above 2" w.g., additional torque required.

Dimensions: . . . . . .Damper width x height x frame depth plus 10 to 13 inches; Refer to the mechanical detail view in this document, and the individual Damper Series data sheets for dimensions of each damper. Dampers are made to size required, to the nearest 1/8", without blanking off free area.

TAMCO AIR-IQ Available Damper Styles

Series 1000 Air-Foil Control

Series 1500 Ultra-Low Leakage Air-Foil Control

Series 1400 Air-Foil Control with 4" blades

Series 9000 Thermally Insulated/Thermally Broken Blades

Series 9000 SC Thermally Insulated/Thermally Broken Blades Severe Cold Temperature

Series 9000 BF Thermally Insulated/Thermally Broken Blades and Frames

Series 9000 ECT Thermally Insulated/Thermally Broken Blades and frames - Extreme Cold Temperature

TAMCO AIR-IQ - SW Option

Series: 1000 SW, 1500 SW, 1400 SW and 9000 SW.

Salt Water Resistance Option dampers are designed for Marine and Salt Water environment operation, with anodized aluminum construction and stainless steel hardware.

AIR-IQ aluminum sleeve and flare are anodized when SW Option is selected.

EBTRON AIR-IQ Airflow Measurement Station

Calibrated Range: . . . . . .0 to 5,000 fpm [25.4 m/s]

Operating Temperature: . . . .Sensor Probe: -20 to 160°F [-28.9°C to 71.1°C]
Transmitter: -20 to 120°F [-28.9°C to 48.9°C]

Operating Humidity Range: .0 to 99% non-condensing; Transmitter must be protected from exposure to precipitation

Power Requirements: . . . . . .24 VAC (22.8-26.4 VAC) at 12-20 VA (based on sensor quantity)

Transmitter Construction: . .Heavy duty industrial grade IC's; rugged aluminum chassis

Transmitter Dimensions: . . .9.251 x 6.688 x 2.5 in (HxWxD) [234.98 x 169.87 x 63.5 mm]

Transmitter Mounting: . . . . .Mounting holes located 0.75 in from top/bottom, and 0.375 from left/right edges on integral mounting plate

Calibrated Sensor Accuracy: Airflow: ±2% of reading
Temperature: ± 0.15°F [± 0.08°C]

Probe Construction: . . . . . .Type 6063 gold anodized aluminum; Type 316 stainless steel (optional)

Probe Mounting: . . . . . .Type 304 SS mounting brackets

Probe Dimensions: . . . . . .Alum: 1.1 in [27.94 mm] diameter
SS: 1.125 in [28.575 mm] diameter

Standard Size Ranges: . . . .12 to 120 in [304.8 to 3048 mm]

Probes / Sensing Nodes: . . . .4 probes maximum; 8 sensing nodes per probe; 16 nodes total maximum

Probe/Transmitter Cable: . .10 ft. [3.05 m] plenum rated FEP cable, positive locking connector with gold plated pins (Optional length up to 50 feet [15.24m])

GTC-PC Analog Output: . . . .Isolated analog 0-5/0-10 VDC or 4-20 mA, linear airflow/temperature

Resolution: . . . . . .0-10V/2-10V: 0.010% of full scale
0-5V/1-5V: 0.020% of full scale

GTC-PC RS-485 Output: . . . .Field selectable BACnet® MS/TP Master, Modbus RTU or JCI N2-Bus®

Baud Rate: . . . . . .9.6k, 19.2k, 38.4k, and 76.8k baud

Repeatability: . . . . . .0.25% of reading

Field Calibration Wizard: . . .Automated 1 or 2 point cal adjust

Output Signal Filter: . . . . . .Field Adjustable 0 to 99%

Low Limit Cutoff: . . . . . .Zeroes output below adjustable value

Programmable Alarm: . . . . .Alarms for user defined Hi or Low Limits, Setpoint with hysteresis for airflow or transmitter/probe faults.

AIR-IQ Available Outputs/Network Protocols

Analog/RS-485:	Model suffix /**GTC-PC**
RS-485 ARCNET:	Model suffix /**GTN-PC**
Ethernet:	Model suffix /**GTE-PC**
LONWORKS:	Model suffix /**GTL-PC**

TS_AIR-IQ_GTC-PC_R1C

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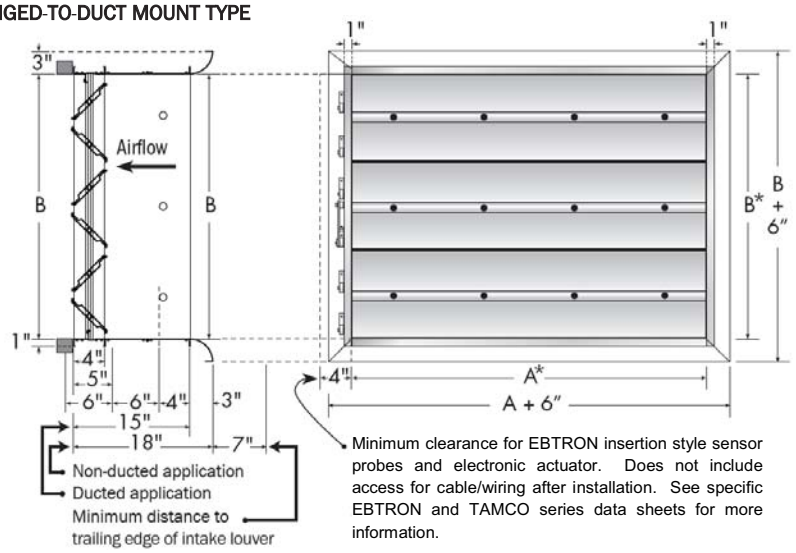
AIR-IQ GENERAL MECHANICAL OVERVIEW

Typical single and two-section horizontal dampers are illustrated below. Vertical damper blade configurations are also available. For series-specific damper options and details, refer to the individual series specifications and data sheets available at www.tamcodampers.com. Complete EBTRON Gold Series GTX116 Air Flow Transmitter options and details are available at www.EBTRON.com.

AIR-IQ TYPICAL SINGLE SECTION HORIZONTAL BLADE DAMPER

FLANGED-TO-DUCT MOUNT TYPE



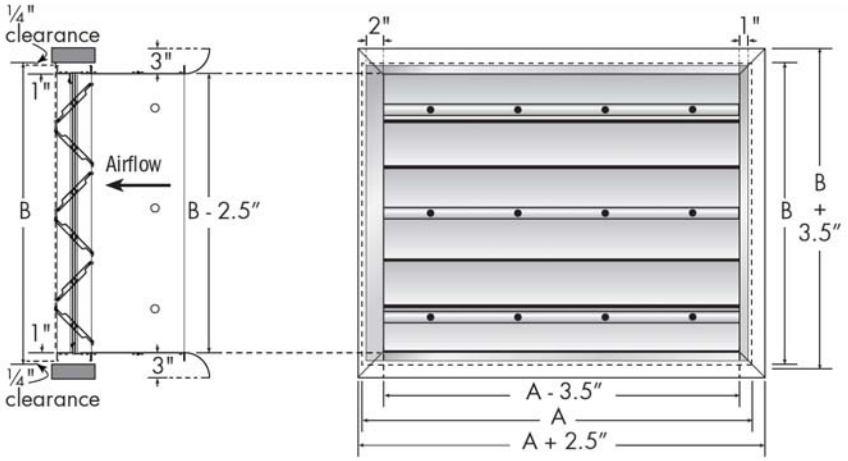
SINGLE SECTION FLANGED-TO-DUCT MOUNT TYPE
MINIMUM SIZE:
Damper: 6"w x 6"h

MAXIMUM SIZE:
60"w x 60"h or
48"w x 72"h
(Limiting section width to 48" allows height to increase to 72")

MAXIMUM AREA:
25 ft.²

***NOTES:**
A x B = *Always the opening dimensions*
Width = A: *Always the dimension parallel to the blades*
Height = B: *Always the dimension perpendicular to the blades*

INSTALLED-IN-DUCT MOUNT TYPE



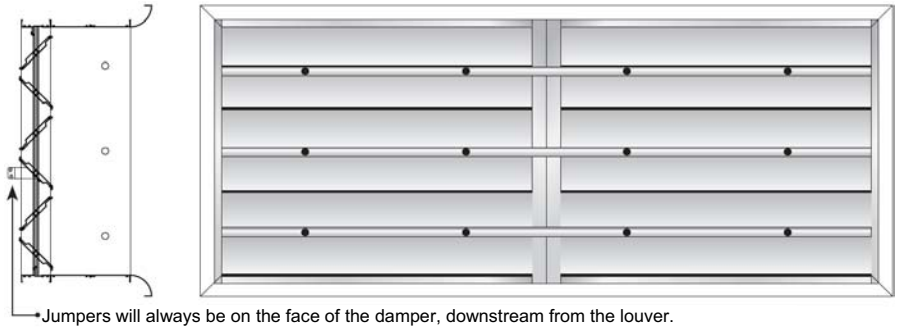
SINGLE SECTION INSTALLED-IN-DUCT MOUNT TYPE
MINIMUM SIZE:
Damper: 9.5"w x 8.5"h

MAXIMUM SIZE:
60"w x 60"h or
48"w x 72"h
(Limiting section width to 48" allows height to increase to 72")

MAXIMUM AREA:
25 ft.²

AIR-IQ TYPICAL TWO-SECTION HORIZONTAL BLADE DAMPER

INSTALLED-IN-DUCT AND FLANGED-TO-DUCT MOUNT TYPES



TWO-SECTION INSTALLED-IN-DUCT AND FLANGED-TO-DUCT MOUNT
MINIMUM SIZE:
Flanged-to-Duct
Damper: over 60"w x 6"h

Installed-In-Duct
Damper: over 60"w x 8.5"h

MAXIMUM SIZE:
For maximum sizes, see table titled:
AIR-IQ AVAILABLE SIZES / SENSOR PROBE SUITE CONFIGURATION

MAXIMUM AREA:
40 ft.²

Contact TAMCO Customer Service for information regarding sleeve sizes and finished outside flare dimensions for two-section assemblies.

AIR-IQ AVAILABLE SIZES / SENSOR PROBE SUITE CONFIGURATION

AIR-IQ Damper/Airflow measurement solutions are available in single and two-section horizontal and vertical blade designs in the following sizes:

Number of Probes / Number of Sensors per Probe
TAMCO/EBTRON AIR-IQ Package
PROBES MOUNTED PARALLEL-TO-BLADES

DIMENSION "B" - HEIGHT \ DIMENSION "A" - WIDTH	12	18	24	30	36	42	48	54	60	66	72	84	96	108	120
12	1/2	2/2	1/4	1/4	1/4	1/4	1/6	1/6	1/6	1/6	1/6	1/6	2/4	2/4	2/4
18	2/2	2/2	2/2	2/2	2/3	2/3	2/3	1/6	1/6	1/8	1/8	1/8	2/6	2/6	2/6
24	4/1	2/2	2/3	2/3	2/3	2/3	2/4	2/4	2/4	2/4	2/6	2/6	2/8	2/8	2/8
30	4/1	4/1	3/2	2/3	2/3	2/4	2/4	2/4	2/6	2/6	2/6	2/8	2/8	2/8	2/8
36	4/1	3/2	3/2	3/2	3/3	3/3	3/4	3/4	3/4	4/4	4/4	4/4	2/8	2/8	2/8
42	4/1	3/2	3/2	4/2	3/3	3/4	3/4	3/4	4/4	4/4	4/4	4/4	4/4	2/8	2/8
48	3/2	3/2	4/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
54	3/2	3/2	4/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA
60	3/2	3/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA
66	3/2	4/2	4/2	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA	NA
72	3/2	4/2	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA	NA	NA

1 Damper Section
2 Damper Sections

Number of Probes / Number of Sensors per Probe
TAMCO/EBTRON AIR-IQ Package
PROBES MOUNTED PERPENDICULAR-TO-BLADES

DIMENSION "B" - HEIGHT \ DIMENSION "A" - WIDTH	12	18	24	30	36	42	48	54	60	66	72	84	96	108	120
12	1/2	2/2	4/1	4/1	4/1	4/1	3/2	3/2	3/2	4/2	4/2	4/2	4/2	4/2	4/2
18	2/2	2/2	2/2	2/2	3/2	3/2	3/2	3/2	3/2	4/2	4/2	4/2	4/3	4/3	4/3
24	1/4	2/2	3/2	3/2	3/2	3/2	4/2	4/2	4/2	4/2	4/3	4/3	4/4	4/4	4/4
30	1/4	1/4	2/3	3/2	3/2	4/2	4/2	4/2	4/3	4/3	4/3	4/4	4/4	4/4	4/4
36	1/4	2/3	2/3	2/3	3/3	3/3	4/3	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4
42	1/4	2/3	2/3	2/4	3/3	4/3	4/3	4/3	4/4	4/4	4/4	4/4	4/4	4/4	4/4
48	2/3	2/3	2/4	2/4	3/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
54	2/3	2/3	2/4	2/4	3/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA
60	2/3	2/3	2/4	3/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA
66	2/3	2/4	2/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA	NA
72	2/3	2/4	3/4	3/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	NA	NA	NA	NA

1 Damper Section
2 Damper Sections

TORQUE REQUIREMENTS

Sealing Torque in/lbs @ P_{DIFF} of ≤ 2 in. w.g. and face velocity ≤ 1000 fpm

DIMENSION "B" - HEIGHT \ DIMENSION "A" - WIDTH	12	18	24	30	36	42	48	54	60	66	72	84	96	108	120
12	20	22	24	25	27	29	31	32	34	52	54	58	61	65	68
18	23	25	27	28	30	32	34	36	38	59	61	65	68	72	76
24	26	28	30	32	34	37	39	41	43	67	69	73	78	82	86
30	32	35	37	40	43	46	48	51	56	83	86	91	96	102	111
36	36	39	42	45	48	51	54	62	69	93	96	102	109	123	138
42	39	43	46	49	52	56	65	73	82	102	105	112	129	147	164
48	43	46	50	53	57	65	75	85	95	110	113	130	150	170	190
54	46	49	53	57	63	74	85	97	108	117	126	148	171	N/A	N/A
60	49	53	57	61	70	83	96	109	121	128	141	166	192	N/A	N/A
66	55	59	63	68	78	92	106	120	135	142	156	184	N/A	N/A	N/A
72	58	62	67	71	86	101	117	138	142	156	171	N/A	N/A	N/A	N/A

Sealing Torque in/lbs. @ P_{DIFF} > 2 in w.g. and ≤ 2.5 in. w.g. and face velocity ≤ 1000 fpm

DIMENSION "B" - HEIGHT \ DIMENSION "A" - WIDTH	12	18	24	30	36	42	48	54	60	66	72	84	96	108	120
12	20	22	24	25	27	29	31	32	34	52	54	58	61	65	68
18	23	25	27	28	30	32	34	36	38	59	61	65	68	72	76
24	26	28	30	32	34	37	42	48	53	67	69	73	84	95	107
30	32	35	37	40	43	48	55	62	70	83	86	95	110	125	139
36	36	39	42	45	50	59	68	77	86	93	100	118	136	154	172
42	39	43	46	49	59	70	81	92	102	108	119	140	162	183	205
48	43	46	50	57	69	81	94	106	119	126	138	163	188	213	238
54	46	49	53	64	79	93	107	121	135	143	157	185	214	N/A	N/A
60	49	53	57	72	88	104	120	136	152	160	176	208	240	N/A	N/A
66	55	59	63	80	98	115	133	150	160	178	195	230	N/A	N/A	N/A
72	58	62	69	88	107	126	146	156	176	195	214	N/A	N/A	N/A	N/A

NOTE: *AIR-IQ maximum differential pressure is 2.5 in. w.g.*

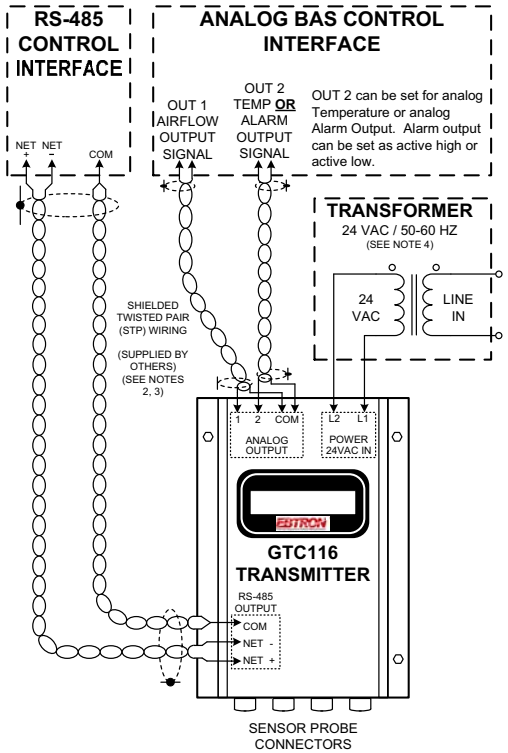
Velocity Torque in/lbs @ 1000 fpm *(Use multipliers below for other velocities.)*

DIMENSION "B" - HEIGHT \ DIMENSION "A" - WIDTH	12	18	24	30	36	42	48	54	60	66	72	84	96	108	120
12	3	5	7	10	12	14	17	19	21	22	24	28	34	38	42
18	5	9	13	16	20	23	27	31	34	36	40	46	54	61	68
24	8	13	17	22	27	32	37	42	47	49	54	64	74	84	94
30	10	16	22	29	35	41	48	54	60	64	70	82	96	108	120
36	12	20	27	35	43	50	58	66	73	78	86	100	116	132	146
42	14	23	32	41	50	59	68	77	87	91	100	118	136	154	174
48	16	27	37	48	58	68	79	89	100	106	116	136	158	178	200
54	18	30	42	54	66	77	90	101	113	120	132	154	180	N/A	N/A
60	21	34	47	60	73	86	100	113	126	133	146	172	200	N/A	N/A
66	23	37	52	66	81	95	110	124	139	147	162	190	N/A	N/A	N/A
72	25	41	57	73	88	120	136	136	152	161	176	N/A	N/A	N/A	N/A

NOTES: Always use greatest torque value, when comparing calculated Velocity torque chart vs. Sealing torque at applicable P_{DIFF} chart.

@ 1500 fpm Multiply value by ***2.5***
@ 2000 fpm Multiply value by ***4***
@ 2500 fpm Multiply value by ***6.25***
@ 3000 fpm Multiply value by ***9***
@ 3500 fpm Multiply value by ***12.25***
@ 4000 fpm Multiply value by ***16***

TYPICAL WIRING DIAGRAM



NOTES:
1. OUTPUT 2 CAN BE SET AS TEMPERATURE OR AS AN ALARM. ALARM CAN BE SET AS ACTIVE HIGH OR ACTIVE LOW.
2. CONNECT OUTPUT SIGNAL CABLE DRAINS TO EARTH GROUND AT ONE END OF EACH CABLE ONLY.
3. RS-485 COM CONNECTION MAY USE A SINGLE CONDUCTOR.
4. ON MULTIPLE TRANSMITTER INSTALLATIONS WITH A COMMON 24VAC SOURCE, WIRE 24 VAC POWER IN-PHASE TO THE SAME TERMINALS ON ALL TRANSMITTERS (e.g.: L1 to L1, L2 to L2).

TS_AIR-IQ_GTC-PC_R1C

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