

**Improvement actions: 24V Supply**  
according to ISO/DIS 14955-1

| No. | Requirements on   | Description   | Relevant for machine tool                      | Estimated Energy savings |
|-----|---|---|--|--------------------------|
| 1   | Minimize energy losses in power supplies                      | Usage of high efficiency transformer or voltage-proof converters instead of conventional transformers (e.g. controlled switching power for auxiliary power 24V).  | Metal cutting                                  | 3,1 – 3,6%               |
| 2   | Avoidance energy losses of power supplies                     | Avoid power losses in the transformer by use of e. g. voltage-proof converter, controlled switching power supply for 24V control voltage  | Mechanical Press; Servo Press; Hydraulic Press |                          |
| 3   | Converter with power factor correction                        | Power factor in the infeed unit for feed operation and regenerative feedback saves energy losses.   | Metal cutting                                  | 3,7 – 4,5%               |
| 4   | High efficiency transformer                                   | Load requirement of a machine tool is not constant during the cycle. Therefore it is more efficient to install transformers optimized on low Fe- losses instead of transformers optimized on low Cu- losses.  | Mechanical Press; Servo Press; Hydraulic Press | 3,1 – 3,6%               |
| 5   | Thermal management regarding control cabinet                  | Optimized concept for thermal management of the control cabinet;1. Minimization of waste heat;2. If waste heat is not avoidable, it has to be dissipated (air cooling or water cooling); for reuse of thermal energy water is given a preference compared to air; further use of waste heat has to be checked/discussed with customer; 3. Controlled ventilation (fan). | Metal cutting                                  | 3,7 – 4,5%               |
| 6   | Apply the simultaneity factor when designing the power system | Avoid oversizing of power supply leads to lower absolute energy losses. Avoid overload as well.   | Mechanical Press; Servo Press; Hydraulic Press | 3,7 – 4,5%               |
| 7   | Converter/inverter with power factor correction               | Power factor in the infeed unit for feed operation and regenerative feedback saves power losses.  | Mechanical Press; Servo Press; Hydraulic Press | 3,7 – 4,5%               |

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|----|--|--|--|------------|
| 8  | Thermal management regarding control cabinet   | Optimized concept for thermal management of the control cabinet;1. minimization of waste heat;2. if waste heat is not avoidable, it has to be dissipated (air cooling or water cooling); for reuse of thermal energy water is given a preference compared to air; further use of waste heat has to be checked/discussed with customer;3. controlled ventilation (fan);4. low maintenance air conditioner (no air filter) and thermostatic air conditioning with open-door-shutoff. | Mechanical Press; Servo Press; Hydraulic Press | 3,7 – 4,5% |
| 9  | Demand depending controlled peripherals (..devices like mist extraction, chip conveyor, etc) | Active mode of oil mist exhaust system, depends on operating mode  | Metal cutting                                  | 3,7 – 4,5% |
| 10 | Controlled peripheral devices like mist extraction, scrap conveyor, etc                      | Active mode of devices, dependent on mode of operation   | Mechanical Press; Servo Press; Hydraulic Press |            |